Chemical Week

July 24, 1954

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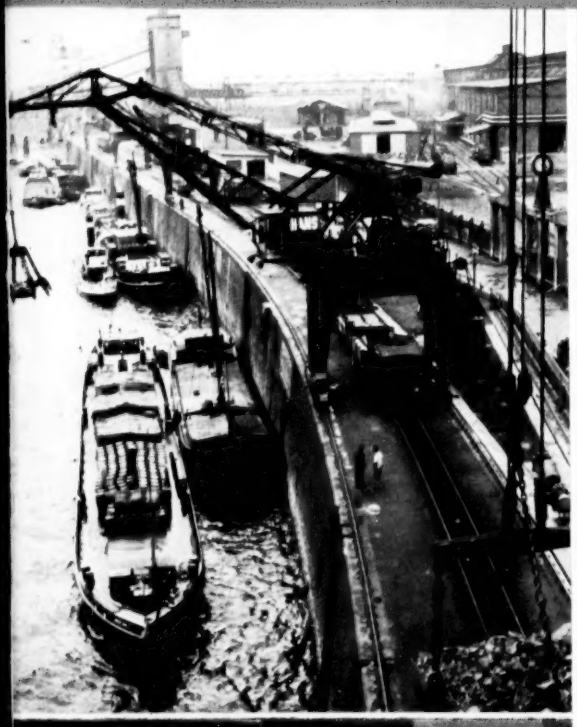

Outbound chemicals from West Germany's rebuilt plants vie for world markets . . . . . p. 18

"Dishpan hands" distress detergent makers, enkindle research on dermatitis . . . . . p. 38

Shell Chemical eyes Western Ammonia market, plumps $3 million into its distribution setup . . p. 48

Eventually: alumina from low-grade silicate ores; now: a process that can do it . . . . . p. 54

Sloan-Kettering researchers take a chemical tack on cancer research; here's how . . . p. 74

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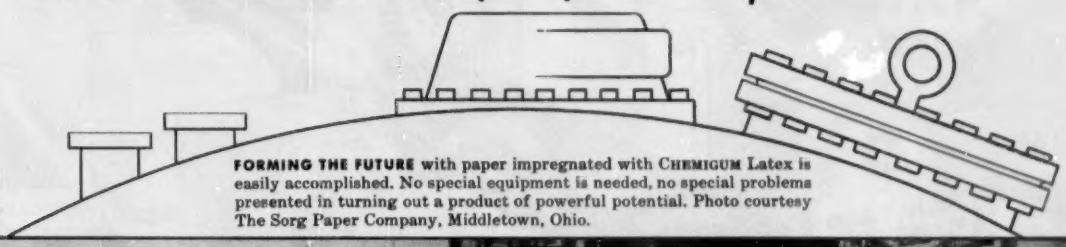
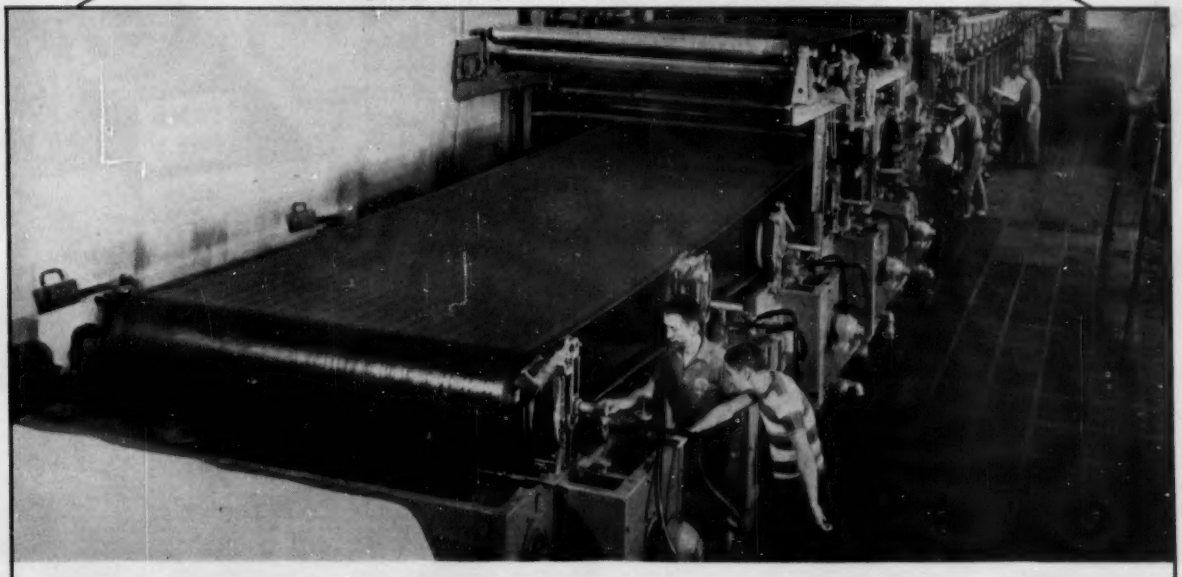


FORMING THE FUTURE with paper impregnated with CHEMIGUM Latex is easily accomplished. No special equipment is needed, no special problems presented in turning out a product of powerful potential. Photo courtesy The Sorg Paper Company, Middletown, Ohio.



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Chemical Week

Volume 75 **July 24, 1954** Number 4

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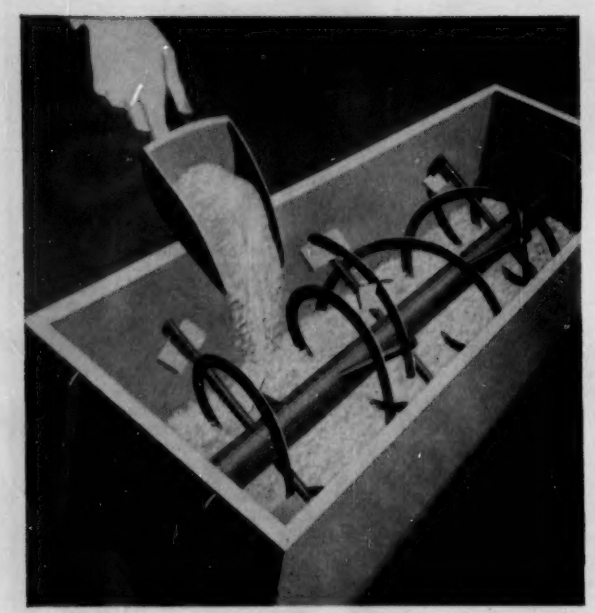
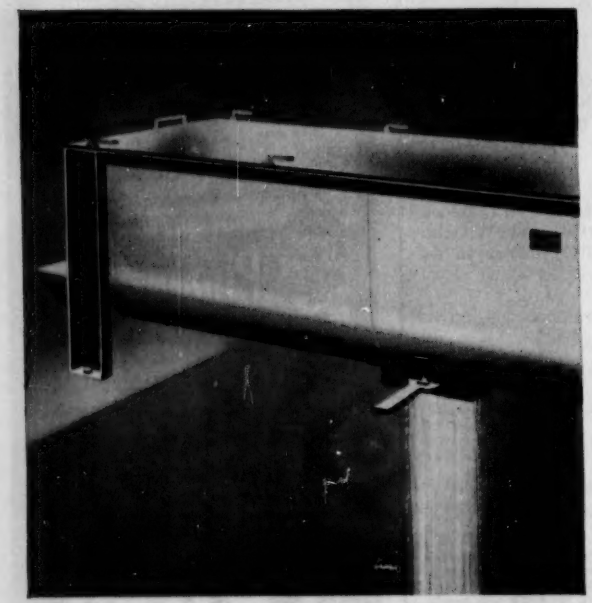
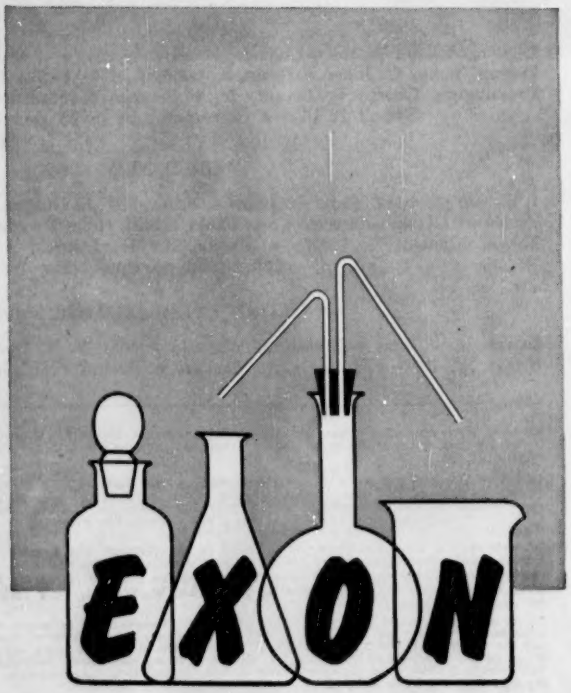


1. In preparing a sample formulation, picture shows Exon 500 resin as it is shipped by Firestone. It is in white powder form—has excellent dry blending characteristics.

2. Blending liquid plasticizer with Exon 500. Each of the controlled particles of Exon 500 act as a tiny sponge, quickly and completely absorbing liquid ingredients.



3. Result! A complete Exon 500 resin compound ready for the hopper. The formulation is free-flowing, lump free. Milling and pelletizing is never necessary.



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Physical Properties	
Form	White Powder
Specific Gravity	1.40
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Average Relative Viscosity	2.55
Approximate Electrical Properties	
Insulation Resistance (*15.6°C*) (*Megohms/1000 ft.*)	4500
Dielectric Constant (*23°C*) (*SIC—one day*)	7
Dielectric Strength, KV. (*in oil at 23°C*)	35-37
Power Factor (*60 cycles at 23°C*)	0.099-0.100

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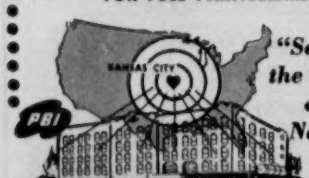

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OPINION. . . . . .

Likes Alkalies

To the Editor: We would like to offer our congratulations to you and to Ethyl Corp.'s Marshall Sittig for presenting so clearly the review of the alkaline metals (*June 26*) . . .

Stan S. Wilson
Sales Manager
Bart Manufacturing Corp.
Belleville, N.J.

Punch At Pentagon

To the Editor: We have just finished reading your frightening news article: "Punch for Power" (*June 26*). The figures quoted in the next to last paragraph are particularly impressive. For curiosity's sake we have consulted packing-fraction curves and tables of binding energies, and find (sure enough!) that the "fission" of a carbon atom to form one boron atom and one hydrogen atom does indeed involve 16 mev. And if one pound of carbon *were* converted by this reaction, approximately 57 billion Btu.'s would have to be transferred.

The incredible (and frightening) thing is that the *direction* of energy transfer is *incorrect*. It requires 16 mev. to pull a proton out of a carbon 12 atom. It requires 57 billion Btu.'s to convert one pound of carbon into boron and hydrogen.

How could the "highest technical brass" in the Pentagon have overlooked the fusion reaction of light elements?

Surely they have heard of thermonuclear weapons, but apparently no one has ever tried to explain the conversion of mass-energy. Who *makes* technical decisions for the Army?

James C. Bresee
Director
M.I.T. Practice School
Oak Ridge, Tenn.

On this issue CW is strictly on the sidelines, for, as we carefully and cautiously pointed out in an editorial note accompanying our report:

"This development may be, as some view it, the 'invention of the century'. On the other hand it may simply be the roseate dream of an overenthusiastic physicist-engineer . . . But this, at least, is a fact: it has attracted the thoughtful attention of a group of the military's top-echelon technical brains. That, alone, makes it newsworthy."

This is the Pentagon's reply to Reader Bresee: There is nothing wrong with Dr. Bresee's conclusions that one must put in 16 mev. of energy to pull a proton from a carbon atom. The reaction in question, though, does not involve the putting in of energy to knock a proton out of a carbon atom. Instead, it involves an internal upset of the atom nucleus which give energies of the 16 mev. range at full efficiency without having to have the same amount of energy put in first.

The phrase, "one possible form the reaction may take", used in the original report, was, in the Pentagon's opinion, "well enough hedged" since admittedly their scientists do not know exactly what the reaction is. Now they're willing to admit that it was unfortunate and misleading that they cited any such example as a possibility.—Ed.

Ringside View

To the Editor: Fluoridation is not yet a burning issue in Britain, but it is likely to become so before very long. In the meantime, I have followed your reports on the U.S. battle, and a few comments from the ringside may be of interest.

Trying to see the picture whole, I side with the anti's, in spite of the fact that, if your reports give a fair picture (as I am sure they do), they seem to come mostly from the lunatic fringe.

My case is simple:

The long-term effects on consumers of artificially fluoridated water cannot, in the nature of the case, have been assessed yet. It has taken a long time to find out that cigarette smoking predisposes to lung cancer. So it's a big risk.

The real answer to the problem of declining standards of dental health is to eliminate the main cause of dental decay—deficient diet—especially during the antenatal period and early childhood. This calls for action—we would say governmental action—on two lines: provision of what we call "welfare foods" as a *right* to *all* expectant mothers and school children; and education of both parents and children to the importance both of eating naturally fortified foods and of avoiding excessive indulgence in such products as refined sugar and phosphoric acid-containing drinks.

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: W. A. Jordan, Chemical Week, 330 W. 42nd St., New York 36, N. Y.

I am sure that this point of view is not so original that it is not held somewhere in the U.S.A. It is certainly not so extreme that even the average Conservative here would regard it as particularly radical.

Why, then, doesn't 'my' side rely on reasoned argument rather than on the hysterical bilge that seems to get all the publicity at the cost, I should think, of alienating every man and woman with intelligence and self-respect?

RONALD H. SMITH
Pine View
Rickett's Hill
Tatsfield, Kent, England

P.S. Congratulations on your editorial, "Conformity Is No Criterion." While confirming the impression that the U.S. is passing through a serious crisis just now, such articles strengthen the hope that those traditions we are proud to think we share with you will soon emerge triumphant—and perhaps stronger for the test to which they are being submitted.

Lactic Outlook

TO THE EDITOR: We were very much interested in your news article on lactic acid (*May* 22). This type of survey and market projection report should certainly be very helpful to industry . . . Perhaps sometime you will do studies on penicillin and lactose . . .

Thanks for a top-notch editorial job . . .

E. RAY WILKIN
Sales Promotion Manager
Western Condensing Co.
Appleton, Wis.

DATES AHEAD

American Pharmaceutical Assn., annual meeting, Statler hotel, Boston, Aug. 22-27.

World Congress on Surface Active Agents, Sorbonne, Paris, France, Aug. 30-Sept. 3.

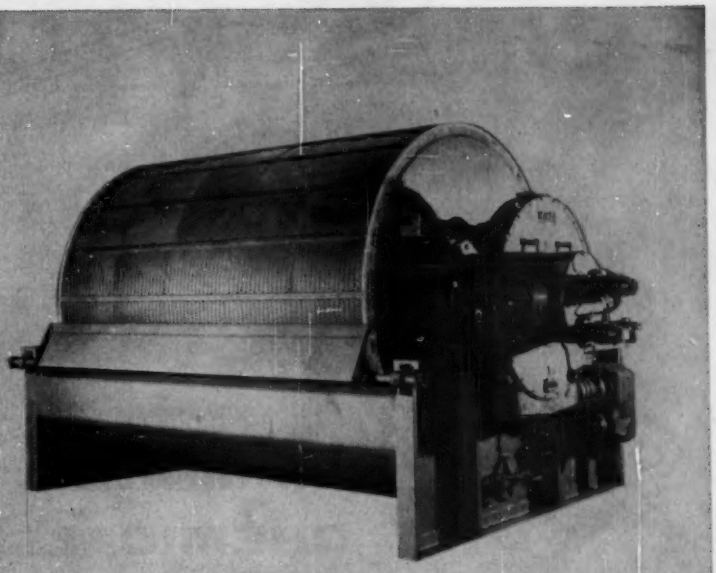
National Agricultural Chemicals Assn., annual meeting, Essex and Sussex hotel, Spring Lake, N.J. Sept. 8-10.

International Congress of Industrial Chemistry, Brussels, Belgium, Sept. 11-19.

American Chemical Society, national meeting, Statler hotel, New York, Sept. 12-17.

Federal Wholesale Druggists' Assn., annual convention, Greenbrier hotel, White Sulphur Springs, W.Va., Sept. 19-22.

Chemical Market Research Assn., fall resort meeting, Equinox House, Manchester, Vt., Sept. 20-21.



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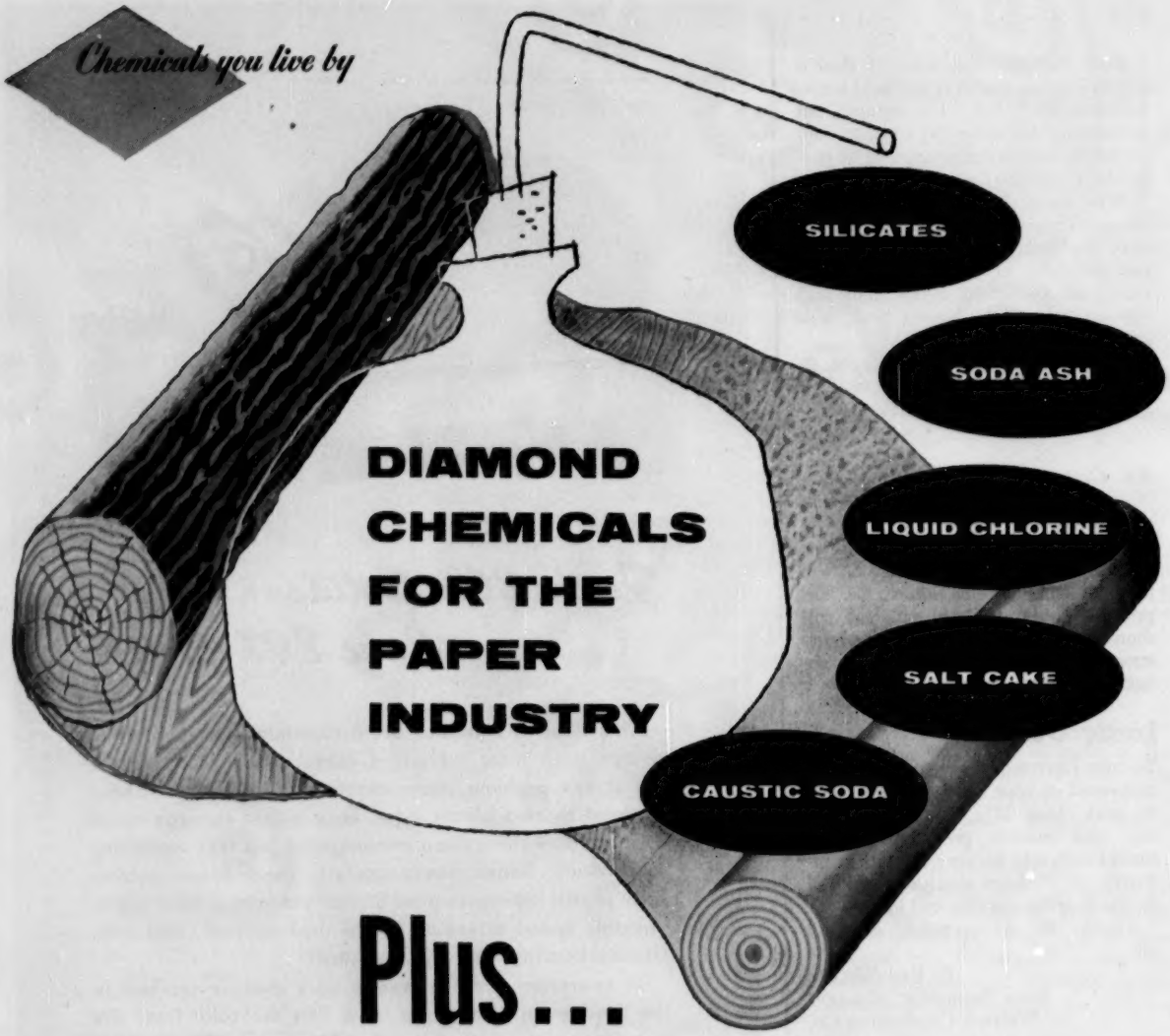

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Chemical Week
BUSINESS MAGAZINE OF THE CHEMICAL PROCESS INDUSTRIES

NEWSLETTER

The Federal Reserve Board's industrial production figures for last month confirm what many chemical executives observed and all of them hoped: that the year-long slide had ended and the curve was starting to turn up again. Chemicals, textiles, steel and household durables all registered gains over the preceding month.

The Administration's advisors now figure that business will stay on a low-level plateau through the vacation period, will move firmly and steadily upwards starting in the fall.

•

The paint industry is eager to help the Navy get out of the paint-making business. It has offered to find comparable industrial jobs for displaced personnel, help sell machinery, equipment and raw materials if only the Navy will discontinue its manufacturing operations at Mare island, Calif., and Norfolk, Va.

The offer, made on the industry's behalf by the National Paint, Varnish and Lacquer Assn., was revealed in testimony before the House Government Operations Committee.

In addition, the association has proposed to Secretary of the Navy Charles Thomas that a joint Navy-industry committee be appointed to study Navy paint requirements, quality controls, inspection and procurement methods, and generally place the technical ability and know-how of the industry at the Navy's disposal.

•

After some hard figuring, the Army has revised the terms on which it will lease or sell the Muscle Shoals, Ala., chlorine-caustic plant. It had asked for proposals with the proviso that, by giving 30-day notice, it could pre-empt all the 225 tons/day of chlorine and 252 tons/day of caustic the plant would produce. It now feels that, under peacetime conditions, it would not need pre-emption rights to more than 150 tons of chlorine and 100 tons of caustic.

The three companies that submitted proposals—Diamond Alkali, Columbia-Southern and Allied Chemical's Solvay Div.—have now been asked to look over their figures (CW, July 10, p. 13), and make any needed changes.

•

There's no chance now of special Congressional encouragement of air pollution equipment purchases.

Congressional conferees, meeting to reconcile differences between House- and Senate-approved versions of the tax bill, have struck out pollution-abatement provisions that would have authorized federal guarantee of equipment loans and set up a $5-million research fund.

•

Now it looks as if Boulder City, Nev., will get Aero Metals' proposed titanium plant after all—despite the town council's objections (CW Newsletter, June 26).

The Bureau of Reclamation has now overruled the council, has ordered E. G. Nielsen, regional director, to proceed with negotiations with

Aero Metals for a lease of 25 acres of land to establish a $1-million titanium plant. (The plant would bring in an $800,000 annual payroll.)

The council had rejected the lease site, had offered an alternate site one mile west of town. But the bureau took recognition of a petition signed by 1,046 residents in favor of the site, said, "The objective of the advisory council does not coincide with the opinion of a large segment of the local citizens."

•

Basic Management Inc.—the five process firms that occupy the wartime magnesium plant—will become a part of Henderson, Nev., if city councilmen have their way. In the latest move in the running tiff between town and plantsite (CW, May 1, p. 15), Mayor James B. French proposes, with council approval, that BMI be incorporated by charter into the city, thus enrich the tax take by some $130,000 a year.

French proposes a borough system similar to that of New York City; but each borough, he says, would have its own government and provide its own police and fire departments and other municipal services.

•

Look for a third major manufacturer of percholoric acid. Joining Oldbury Electro-Chemical and G. Frederick Smith Chemical, if present plans materialize, will be Western Electrochemical, Los Angeles. Production will likely be at Henderson, Nev. (BMI), where Wecco currently makes chlorates, percholorates and manganese dioxide.

Planned capacity is large in terms of established markets; hence Wecco will concentrate its development work on new uses.

•

Private operation of the government-owned alumina plant at Laramie, Wyo. (see p. 54), was urged again last week by the Wyoming Natural Resources Board. General Services Administration has received three bids for the facilities, and the board will notify GSA that it favors accepting a bid that will keep the plant intact at its present location.

Still moot, of course, is whether the plant could be operated profitably in competition with facilities using higher-grade ore.

•

Latest to join the trend toward U. S.-foreign joint enterprises (CW, May 15, p. 16) is Oronite Chemical. Together with Distiller Co. Ltd., it is forming Orobis Ltd., which will manufacture lube oil additives at Hull, England. Operation is expected by the end of this year.

•

Two other international developments, however, are making chemical businessmen apprehensive:

In Japan, high government officials have recommended merger of its trading concerns into giant corporations to wage battle for world markets. This will reverse the policy of the Allied occupation after World War II, when the large combines were broken up.

In Washington, Sen. George Malone (R., Nev.) decried attempts by the United Nations to set up international control over raw materials. The proposals, he pointed out, would discourage U. S. production of synthetic rubber and fibers, would, moreover, deny U. S. access to strategic materials in times of defense build-up.

•

Housewives may no longer have to add detergent and bleach separately to their washing machines. Procter & Gamble is test-marketing a combination "Oxydol with Oxygen Bleach" at no increase in price.

. . . The Editors

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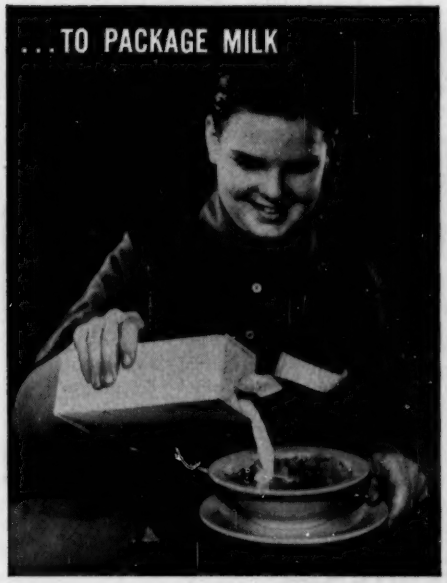

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BUSINESS & INDUSTRY . . .

Bonus Battle

The Dirksen alien property bill—which, its opponents say, would jolt parts of the U.S. chemical and pharmaceutical industries while bolstering some of their foreign rivals—is moving closer to passage this week.

Upon approving the bill in principle, the Senate Judiciary Committee sent the bill back to Sen. Everett Dirksen's subcommittee for minor changes—none of which would change the main provisions of the bill. This week, the full committee is expected to report the bill out to the Senate, where its sponsors think it has an even chance of being passed before next month's adjournment.

However, House action is not likely during this session, so the whole subject will come up again when the new Congress meets next January.

Both in the Administration and in the Senate, Republicans are divided on just what the effects of this measure would be. Secretary of State Dulles *(CW, July 17, p. 14)* testified that legislation of this type would help U.S. relations with Germany and Japan; Asst. Attorney General Dallas Townsend opposed the bill, which he says would be like giving a bonus to former enemy nationals. Sen. Dirksen (R., Ill.) is pushing the measure, and Sen. Robert Hendrickson (R., N.J.) is fighting it.

Outside of Washington, the leading critic of the bill is Francis Brown, president of the Schering Corp., Bloomfield, N.J. Brown has testified against the bill; has urged all his stockholders to join the fight; and last week held a press conference in New York's Waldorf-Astoria hotel to alert the press to what he considers the faults and dangers of the Dirksen proposal.

Points made by Brown:

- Schering, General Aniline & Film, and other industrial properties vested during World War II increased substantially in value under U.S. control; and the former owners don't deserve any "bonus" for that increase.
- Return of seized assets—including many important chemical and pharmaceutical patents—would make it necessary to bill U.S. taxpayers for claims based on war damages suffered by U.S. citizens.
- If German industry needs more assistance—"notwithstanding its present strong position and the more than $3 billion already poured into it"—this should be granted in direct aid, rather than through returning capital goods to "cartel-minded industrialists who are again on the march."

Brown says the Schering patents that might be handed back to the former parent company in Germany were of primary importance in U.S. medical work.

Scientific Noses

Up to now, communities with chemical plants have been concerned only with those industrial waste fumes that were just too obvious to be ignored; but this week's news from Washington is that the Public Health Service is about to expand its air testing program, using sampling devices that can detect gases not noticed by humans.

These samplers—more scientifically accurate than human noses—are to be set up in large cities, wherever there's present or potential trouble with air pollution. Each day, samples of air, "inhaled" rapidly through a filter and into gas testing chambers, will be sent to the new Robert A. Taft Sanitary Engineering Center at Cincinnati, where PHS technicians will run chemical analyses and keep records on pollution in each city.

DR. SCHEELE: In big cities' air, his aides hunt for chemical contaminants.

This will be the most sweeping search for air contaminants in the nation's history, and is expected to lead to detailed information about all the vapors, gases, droplets, spores, pollen grains, bacteria and radioactive particles that spice the air people breathe. Along with further development of air sampling and analysis techniques, PHS staffers will study toxicity of various air pollutants, and the death and sickness rates in areas where air pollution is common.

Fivefold Increase: At present, the Cincinnati laboratory receives atmospheric samples from 25 localities; but this number will be boosted considerably now that the new fiscal year budget has been approved. Congress allocated $25,000 for air pollution research work during the past 12 months, but is raising that allotment to $130,000 for the fiscal year just beginning. This will be part of a long-range, $3.5-million program on environmental sanitation to be conducted by Surgeon General Leonard Scheele and his staff.

Sampling units are set up in two places in each community in the program—a residential or suburban area and a downtown site. Later on, PHS will publish its findings.

Among the questions Scheele's men will be trying to answer:

- Exactly what pollutants are the troublemakers at critical industrial centers like Detroit and Jersey City?
- What chemical or combination of chemicals may have caused the deaths at Donora, Pa., during the 1948 smog disaster?
- What is it that affects the tear glands during smog spells at Los Angeles?

Numerous state and local government agencies, as well as many industrial organizations, have already been working on these and similar problems; but up to now there's been no national center for coordinating all the findings. PHS hopes its Cincinnati point will serve that purpose.

For all manufacturing chemical companies, the new testing and research program will mean still more public attention to air pollution. Plants that so far have escaped criticism may be pointed out as possible sources of pollutants not now considered objectionable.

TEAM VENTURE: Course for Brea's ammonia plant (left) was plotted by Reed, Schaffel, Fifer, Tielrooy, Ray and Foreman, who now pilot Brea . . .

Under Full Sail

Brea* Chemicals, Inc.—the Union Oil subsidiary that's making news on the West Coast with its new production ventures—seems finally to have steadied down to a studied pattern of expansion. With its $13-million ammonia plant, located three miles east of Brea, Calif., in full production (235 tons/day of anhydrous ammonia), and an adjunct dry ice (carbon dioxide) plant running at a rate of 100 tons/day (CW Newsletter, July 17, company sights are now trained on construction of nitric acid and ammonium nitrate facilities to cost over $2.5 million.

Sales volume should reach $6 million this year, $15 million by the end of 1955. "Pretty remarkable growth from any standpoint," admits one competitor; "when you stop to remember that the company was launched less than two years ago (Oct. '52) in the wake of a series of unsuccessful ventures.

Mixed Blessing: That Brea was founded for a dual purpose (to create a chemical business to upgrade Union Oil's raw materials, and also to market the parent company's chemical products) has been both a help and a hinderance. From the standpoint of availability of funds for expansion, there's no doubt that Brea has gained; but at the same time, company executives have inherited a passel of problems, stemming from Union's abortive foray into chemicals through its first Chemical Division—set up in 1945 to market petroleum by-product chemicals. It never really managed to roll, and the division was dissolved in less than a year. Union says, candidly, that it found it couldn't successfully establish a profitable chemical business as a small integral part of its major oil operations "due to the inherent difference in marketing of the products involved."

But the yen to be in chemicals turned out to be just dormant—not dead. In March '51, Homer Reed (then chief engineer in Union Oil's manufacturing department and now president of Brea Chemicals) was asked to prepare a prospectus on potential for Union chemical projects. A special group was created at Reed's request, which included, among others, two of Brea's present officers, Jack Tielrooy, manager of development, and Paul Foreman, assistant secretary and manager of staff.

The group's first proposal was to initiate a program to include production of aromatics—benzene, toluene and xylene; construction of a by-products ammonia plant; and entry into propylene polymer and phenol units. Tentative approval was granted by Union's board of directors; a certificate of necessity was obtained from the Office of Defense Mobilization to build an ammonia plant for $5 million at 45% (*CW, Oct. 10, p. 20*). Too, Reed's group set about making market and engineering studies on phenol, picked up a certificate for this venture, too.

But Union was outpaced—Standard Oil of California and Monsanto jumped into the West Coast phenol picture. That made Union's project a questionable venture and scuttled the captive market it had counted on for a portion of its proposed benzene production. (Standard simply went ahead with its phenol plant; it had its own benzene.) Result: Union was forced to postpone its chemical debut again.

If at First . . .: Thus the formation of Brea Chemicals, Inc., in Oct. '52 represented a rather belated entry of Union Oil into the chemical business.

At its inception, the company was merely assigned the task of marketing Union's methyl and ethyl mercaptans, sulfur, ammonium sulfate, and other by-products. But this phase of operations was to be "of secondary consideration." Brea's primary function was to make chemicals on its own. Thus its initial drive (unusual for the subsidiary of an oil company) has been in agricultural chemicals, with capacity sufficient to make it the second (to Shell) largest producer of agricultural ammonia in the West; its ammonia plant boasts a company-developed manufacturing process; and its plant was built by C. F. Braun and Co.—which had never built an ammonia plant before.

Yet today the company stands as a major factor in the field of chemical fertilizers, and asserts flatly that it will enter any branch of the chemical industry "in which it has an advantage in availability of raw material, know-how, and distribution."

Echoes President Reed: "We're not going to manufacture perfume, but we won't be limited by Union's by-products, either."

Toward this end, the company's research and product development departments are currently working on a variety of projects—particularly in the fields of high polymers, synthetic lubricants, greases, and significantly, "anything to do with plant growth."

Now, after two false starts, Union Oil is solidly in chemical production. How Brea will fare in the rough-tough West Coast race for fertilizer sales, whether it will branch out of agricultural chemicals in the immediate months ahead, still remains to be seen.

* Pronounced Bray-ah.

MORE SHARES FOR FAITHFUL SERVANTS

(Chemical and petrochemical companies' typical stock-option plans for employees)

Company	Year Plan Adopted	No. of shares under plan: Purchased or Authorized	As percentage of outstanding common stock	Percentage of market price paid by employees	No. of employees eligible
Allied Chemical	1953	150,000 (a)	1.69%	95%	125
Amer. Potash & Chem.	1951	26,000 (a)	6.04%	95%	21
Diamond Alkali	1951	40,000 (a)	1.76%	85-95%	100
Dow Chemical	1948	690,000 (est.)	3.22% (est.)	75-85%	22,000
Minn. Mining & Mfg.	1954	150,000 (a)	1.82%	100%	70
Minn. Mining & Mfg.	1954	200,000 (a)	2.43%	95%	12,900
Parke, Davis & Co.	1954	105,000 (a)	2.15%	85%	150
Standard Oil (Calif.) (including Oronite Chemical and Calif. Spray Chem.)	1952	164,000 (p)	0.75%	*	12,700
Union Oil Co. (including Brea Chemical)	1954	(no limit specified)		*	8,500

*Company's contribution varies according to annual profits.

Dealing in on Dividends

Not everybody's doing it, but year by year, a few more large chemical and petrochemical companies (see table, above) are turning to various stock option plans as means of dealing in their executives and other employees on ownership and dividends.

This week—as three other companies decided to offer stock buying programs for the first time—the industry's front-runner in this trend is preparing to start another lap, still enthusiastic after five previous stock offerings. Dow Chemical's Leland Doan says his concern's 1954 employee stock purchase plan will begin Sept. 7, with payments to be completed by next July. Each eligible employee—officers and directors are excluded—will be allowed to buy Dow common stock at cut-rate prices through monthly payroll deductions up to a limit of 10% of annual pay.

Earlier this month, Union Oil Co. of Calif.—including Brea Chemical and other affiliates—got into the act with an "employees' incentive plan" based on pooled purchasing of the company's common stock. Two months ago, Minnesota Mining & Mfg. adopted a double-barreled stock option plan for executives and rank-and-file employees; and in April, Parke, Davis & Co. began a stock option plan for employees receiving salaries of $10,000 or more.

Emulation in England: Also this summer, two large companies in the United Kingdom are starting profit-sharing schemes that involve stock buying and that are being referred to as "copartnership plans."

British financial circles—where vigilance against the Labor Party's Fabian socialism is considered a moral duty—have welcomed the news that ordinary (common) stock will be offered to an estimated 75,000 employees of Imperial Chemical Industries and possibly 20,000 employees of rayon-maker Courtaulds. In acquiring a stake in such companies, a financial editor comments, the workers "could have few better object lessons in the nature and function of capital and management."

For each participant, ICI plans to pay out to trustees 1% of the employee's annual earnings for each 1% that the company's total ordinary-stock dividend is in excess of 5%. Whenever £25 worth of stock is credited to an employee, it will be turned over to him without restrictions.

Pretax Contributions: Union Oil, of whose employees about one-sixth already own stock in their company, expects the new plan to bring about both a substantial increase in that number and a rise in company spirit.

The company will contribute about 3% of operating profits before income taxes, and individuals may put in from 2 to 5% of basic monthly earnings. A bank trustee will use the funds to buy common shares, to be allocated to members according to their contributions.

"Each member," points out President Reese Taylor, "through teamwork and efficiency, can increase the size of the company's contributions by increasing the profits of the company. We believe this is a good, constructive plan with many advantages for both the employees and the company, and we sincerely hope all eligible employees become members."

The Parke, Davis plan is designed "to enable the company to successfully compete in obtaining and retaining outstanding executives and, through the incentives supplied by the plan, to insure continuity of their employment." Directors appointed a committee to make annual or other periodic reviews of employee performance and make "appropriate" option grants, with not more than 10% of the reserved shares to be optioned to any one person.

No Pause on Plans: Elsewhere, the companies that adopted stock plans before this year have reported no trouble in keeping their programs rolling through the past year's mild recession. However, two firms' plans have been relatively inactive so far. One large manufacturer of paints and chemicals expects to push its plan more vigorously once the courts have settled two test cases relating to similar plans offered by other companies.

But in most cases, management is

well pleased with results to date. Dow thinks it's beginning to notice "a little different slant" on the part of employees toward their company. Too, their labor union—at first noncommittal about the plan—has now come out in favor of it. Standard of Calif. feels strongly that its employees are aware of their stock ownership status, and are beginning to make conscious efforts to increase profits, reduce costs. And Du Pont—which awards stock to employees on a merit basis—says that "over the past 49 years, bonus plans have been an important factor in providing effective incentives for outstanding employee performance."

Not every company should use stock plans, that's generally admitted. But when the stock has long-term growth potential the "copartnership" idea obviously unites the interests of the company and its employees.

COMPANIES . . . .

Air Reduction Co., Inc. has awarded the engineering contract for its proposed vinyl acetate monomer plant at Calvert City, Ky., to the Lummus Co. Capacity is listed at 30 million lbs./year; operation is scheduled for early 1956. When in production, the new plant—the latest in the group of plants at Calvert City based on pipeline acetylene from Air Reduction's National Carbide Div.—will be operated by the Air Reduction Chemical Division.

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Agreements covering continued operation of the government-owned magnesium units at Velasco, Tex., have been concluded between Dow Chemical Co. and General Services Administration, as the second step in boosting the national defense stockpile (*CW Newsletter, July 17*). The Velasco magnesium facilities, located in the Plant B area of Dow's Texas Div., were built in 1941-42 to supply World War II military needs, have been operated by Dow Magnesium Corp.—a Dow Chemical subsidiary. Returned to operation with the outbreak of the Korean War, the plant is listed as the only government-owned magnesium facility drawing on sea water as a source of its metal.

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Humble Oil and Refining Co. is said to be making an extensive search for sulfur in the Gulf of Mexico, 70 miles south of New Orleans. Cores are being taken down to 3,500 ft. in the cap rock of a salt dome 5½ miles offshore from Grand Isle in LaFourche Parish. Three tests in the cap rock to determine sulfur content have already been made, but company officials won't reveal results as yet. Humble leases the offshore land from the federal government, and under terms of a recent agreement with the Interior Dept. must drill at least 20 core holes in the next two years.

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Chemurgy Products, Inc., Greenville, S.C., has been incorporated to manufacture chemicals. Capital stock: $10,000.

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A new $5-million uranium company—Pan American Uranium Co.—has recently been organized in Houston, Tex. Headed by Houston's young financial fireball, M. A. S. Makris, the group plans to buy up uranium claims and properties throughout the Colorado Plateau area of southeastern Utah and western Colorado, also anticipates investing in exploration operations in South America. Says Makris: "We'll proceed along the line of the oil business. Of every 10 oil wells, you expect to get two good ones."

National Cylinder Gas Co. has acquired California Carbonic Co., Los Angeles—to augment its carbon dioxide business. All outstanding capital stock of California Carbonic has now been transferred in exchange for 22,576 shares of National Cylinder common stock.

EXPANSION . . .

Phosphoric Acid: Breaking their own construction estimates, executives of Shea Chemical Corp., Baltimore, last week brought their new phosphoric acid plant at Jeffersonville, Ind., into operation. Next on the slate for completion: sodium tripolyphosphate units, designed to produce up to 45,000 tons/year, which should be in operation by mid-August. Company officials say they have already test run the acid plant at a rate of 80,000 tons/year; tripoly production should be in full swing by mid-1955.

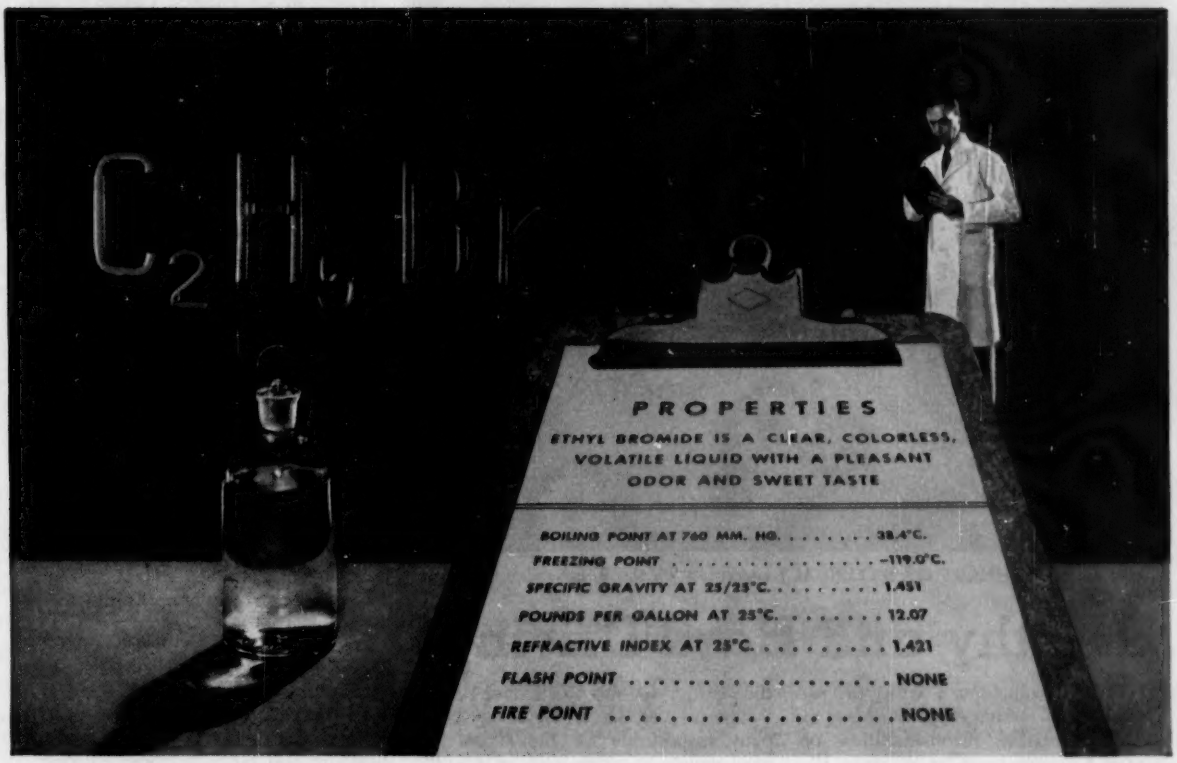
Bossie Means Business

THESE COWS are getting their licks at salt blocks containing a novel organic iodine compound — 3,5-diiodosalicylic acid — which now replaces thymol iodide in the Morton Salt Co.'s trace-mineralized salt.

Features of the new additive: it's more stable, weathers better, can be assimilated more readily, and it's cheaper than the thymol compound.

Apart from iodine, trace-mineralized salt licks usually contain zinc, cobalt, copper, iron and manganese compounds. The industry's job:

To convince farmers that the added annual $7 cost per head of livestock pays off in healthier, more productive animals. Potential salt market for all livestock—if all farmers were sold on salt—some 1,400,000 tons/year.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HEART OF BAYER: At Leverkusen, on the Rhine.

Healthy and Hard-Driving

In curious coincidence with the recent stir of activity in Washington over a possible reconsideration of vested German assets (CW, July 17, p. 14) are reports emanating from Germany this week on the health of its major chemical firms. Consensus: business right across the line is booming; postwar reconstruction is virtually complete.

Most tangible evidence of the dogged determination that pervades the entire industry today: sales of West German chemical products are still on the upgrade (2,915 million marks in the first quarter of 1954); exports are hitting an all-time peak (691 million marks in the first quarter—up 35.2% over 1953).

There is, of course, no single company responsible for the surge. All have striven to regain rank with U.S.-British competition that has had the benefit of "a 10-year jump." But eyes, naturally enough, are on the I. G. Farbenindustrie Aktiengesellschaft successor companies—Germany's prime candidates for world trade recognition.

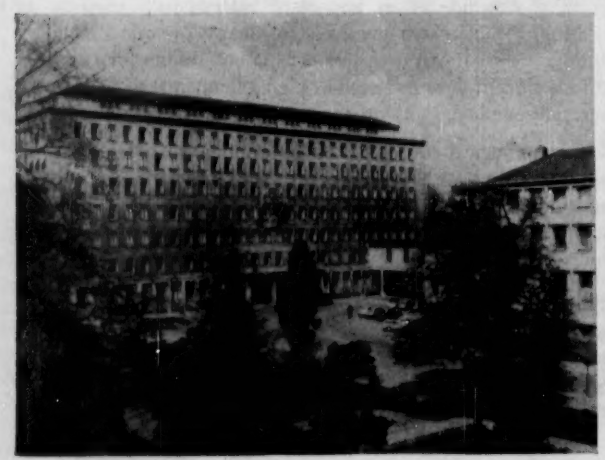
Setting the Standard: In the lead today (and typical in every way—except size—of the general pattern of rejuvenation) is Farbenfabriken Bayer Aktiengesellschaft—largest of the Farben splinters. Its total share capital now stands at 387.7 million DM; its output stems mainly from production centers at Leverkusen (home office), Elberfeld, Dormagen, and Uerdingen. Employees number 36,800—1,400 of whom are university-trained chemists, physicists, or engineers. Products total 13,000—ranging from dyestuffs, textile auxiliaries, basic inorganic and organic chemicals, pharmaceuticals, insecticides and fungicides to photographic products and synthetic fibers. Sales in 1953—as a result of all operations—amounted to 1,025 million DM (approximately $244 million).

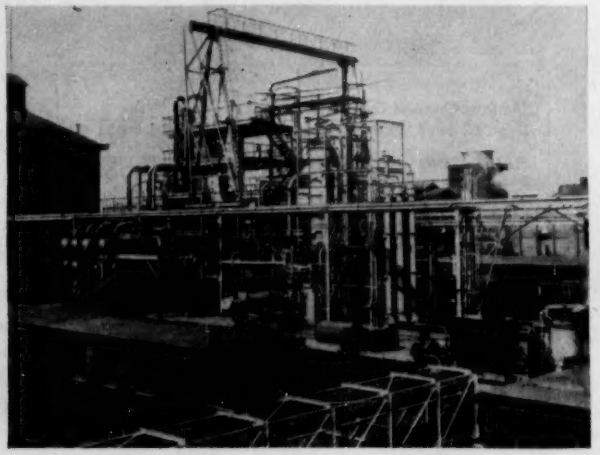
Moreover, export shipments are running close to 30% of total production and show every sign of picking up in the months ahead. In addition, Bayer is counting on its cooperative venture with Monsanto (*CW, July 17, p. 66*), to yield it a share of the lucrative U.S. plastics business.

Not Far Behind: Well within hailing distance, and picking up speed, is Badische Anilin & Sodafabrik AG (BASF) of Ludwigshafen. Its total capital today is listed at DM 340 million—some $81 million. Employment is near 30,000. And although retarded by the disastrous explosion in July '48 (roughly estimated to have cost DM 80 million in damages), BASF by this quarter seems to have shaken off its extraordinary expenditures for rebuilding and reconstruction. Further: production is climbing, and the company is well set to exploit foreign markets—on the Continent, in Africa, the Far East and South America.

Its operations are still largely centered at Ludwigshafen—one of the largest chemical concentrations in Europe. But company executives, with an eye on U.S.-German joint ventures, predict the greatest expansion in the months ahead will be elsewhere. Just where, nobody will say.

Activity's Everywhere: Latest word





NEW FRONTS ON OLD FACES: Bayerhaus (left), acrylonitrile units, and pharmaceutical laboratories (right) . . .

from Chemische Werke Huels (a much smaller Farben splinter) emphasizes the company's concerted drive to get back into buna rubber production on a major scale. According to the West German Economics Ministry, two alternate proposals are now under consideration: Huels will either choose to process 50,000 tons/year of butane (to be bought from the U.S.), or it will decide to process 190,000 tons of crude oil/year itself—whichever proves most economically feasible.

Objective: to raise buna output to 500 tons/month. Shunted aside for the time being is the plan to use French alcohol (*CW, April 10, p. 14*) as a butadiene base.

And if individual enterprise isn't sufficient, the German government stands ready to encourage the rise of the German chemical industry. It's just drawn up a plan to invest DM 600 million in industry expansion this year —some 20-25% of which will be slated specifically for use in the reconstruction of dismantled plants. For the chemical industry, in particular, that should mean a major assist—since many companies, large as well as small, suffered the double blow of bomb damage plus Russian dismantling.

There's some wonder, in the light of all this activity, as to the timing of Economics Minister Erhard's appeals for restoration of confiscated German assets "to improve the position of the German chemical industry."

Certainly the principles behind confiscation and compensation should be reviewed by the U.S. government as strictly judicial policy, but not, as one observer points out, "with the remarkable strides of the German chemical industry introduced as evidence pro or con."

. . . as they stand today.

NEWARK NEWS

NEW JERSEY WATER SAMPLERS: In search for polluters, no certain clues.

Detectives at Work

Seeking answers to the "who-done-it" kind of questions raised by innumerable detective stories—both fact and fiction—appears this week to be the current phase of this country's intensified efforts to curb water pollution.

And because chemical plants frequently are located in the populous industrial centers along streams that are now branded as polluted, it's becoming a fad to point the finger of suspicion at the chemical companies.

But so far, zealous detective work has failed to haul up any incriminating evidence against the chemical concerns. For example, following the recent appearance of numerous dead fish on the surface of Raritan Bay, New Jersey's State Division of Fish & Game sent out a water-borne expedition (*see cut, above*) to collect samples of the water and the dead fish. Autopsies and chemical analysis, says A. Heaton Underhill, executive director of the division, have not tended to pin particular blame on any chemical process plants. He says the river has been badly polluted, but that these were probably the most immediate causes of fish deaths:

- Storm tides that pushed back the river current, slowing down the normal dilution of the river's flow.
- Normal, seasonal death of a large number of menhaden fish, with considerable oxygen consumed in the decomposition of the carcasses.
- Suddenly rising temperatures that drove much of the remaining dissolved oxygen out of the water.

In other words, Underhill explains, it seems that the fish suffocated because there wasn't enough oxygen in their water. He figures that pollution contributed to that situation, but that no single pollutant was particularly lethal.

Another spot where pollution detectives were on duty this summer was in the Delaware River near Philadelphia—only the anticipated "murder" didn't happen. In late spring of the two previous years, thousands of dead fish turned up there, and many people thought it was because of industrial wastes discharged in the river; but this year—with officials of the Interstate Commission on the Delaware River keeping the river surface under surveillance—the various schools of fish didn't go in for mass suicide at all.

"The Incodel committee," says staff engineer John Boardman, "has been unable to find any evidence of unusual industrial pollution at the time of the 1952-53 fish kills; the 'natural causes' explanation may be right."

While the chemical industry has been absolved in these two cases, it's actually being credited in another state with having improved rivers. An Oklahoma scientist says that chemical wastes—if properly regulated—can act as a clarifying agent in streams, boost production of natural foods for the fish.

UP NORTH, STILL HIGHEST

(Comparative salary and wage rates, six industrial centers)

Job Title	Detroit, Mich.	Portland, Ore.	Minneapolis & St. Paul	Philadelphia, Pa.	Dallas, Texas	New Orleans, La.
Office Workers						
Senior accounting clerks, male	$90.00	$76.00	$74.00	$75.50	$85.50	$70.50
Payroll clerks, women	69.00	58.00	56.00	53.50	52.50	50.50
General stenographers, women	67.00	57.50	54.00	55.00	59.50	54.50
Professional and Technical						
Senior draftsmen	109.50	89.00	85.00	94.50	76.50	83.00
Industrial nurses	76.00	64.50	70.00	68.50	65.50	66.00
Maintenance and Power Plant						
Maintenance electricians	2.40	2.27	2.35	2.17	2.09	2.02
Maintenance mechanic (not automotive)	2.41	2.14	2.05	2.11	1.87	1.96
Custodial and Material Moving						
Guards	1.87	1.72	1.74	1.68	1.62	1.53
Shipping clerks	1.98	1.90	1.81	1.74	1.60	1.29
Truck drivers, medium trucks	2.03	1.96	1.87	1.85	1.33	1.27

Diminishing Differential

In some places, Southern wage rates are gaining on pay schedules in Northern industries—apparently as a side effect of more rapid industrial growth in Dixie.

But Northern wage and salary scales are still notably higher than those in Southern plants and offices; and paralleling this comparison is the fact that unionization is much more extensive in the North.

Present outlook is that this geographical wage differential will continue for several years, but it'll keep dwindling as more industries compete for Southern labor and as unions fight harder for Southern following.

If coming events cast their shadows before, as one proverb maintains, then chemical companies feeling the pinch of high labor costs can pick up useful—though not too encouraging—information from certain shadows now emerging from the Southern states.

Up to now, Dixie has been a haven for payroll economy, with pay schedules as much as 20% or more lower than for corresponding jobs in Northern industrial centers. But this week, evidence is that as more and more industrial companies set up new plants in the South, creating greater "demand" on the Southern labor market, Southern pay scales are beginning to gain on Northern wages and salaries.

Industrial firms that move into the South can still count on at least a few years of lower labor costs, because it'll take quite a while for Southern wages to pull up even with Northern rates. But the catching-up process has begun; last year, for example, while average manufacturing wages rose by 7¢ and 11¢/hour in Philadelphia and Detroit, respectively, the corresponding increases in Birmingham and New Orleans were 9¢ and 13¢/hour.

Union Armistice: Last week, another item of significance to southbound industry popped up on the labor horizon. The president of a large AFL union offered to keep his organizers away from any new plant in his union's jurisdiction for three years, providing that the employer will keep wage rates at least 15¢ above the federal minimum. Thus it develops that union organizing activity will be concentrated on low-wage plants—another factor tending to keep pushing Southern wages closer to Northern levels.

Latest data on regional differences in wage and salary rates and fringe benefits comes from a new labor market survey by the U.S. Bureau of Labor Statistics. The table *(above)*—based on the BLS survey—shows that for 10 job titles common to all large and medium-size chemical companies, pay rates as of late 1953 are highest in Northern cities like Detroit, Portland and Minneapolis; intermediate in the Middle Atlantic city of Philadelphia; and lower in the South, as in Dallas and New Orleans.

Roughly parallel to those cities' wage and salary averages are their figures on percentage of employees who are organized by labor unions. In Detroit, 95% of the workers in plants covered by this survey are in bargaining units represented by various unions; in Portland, Minneapolis-St. Paul and Philadelphia, the percentages are 88, 89 and 87, respectively; and in Dallas and New Orleans, only about 62% of the plant workers are covered by union contracts.

Uneven Fringes: There's great diversity in fringe benefit practices in these cities, but here again the Detroit workers seem to be better off. More than 95% of them are now covered by company-sponsored hospitalization insurance, and some 85% have retirement pension programs.

At present, with so much difference in pay rates and fringe benefits, chemical companies contemplating expansion can't afford to overlook this kind of detailed information about labor costs in the locations under consideration. But if present trends continue, those differences will greatly diminish in importance during the coming decade.

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FRATERNIZING: Rayonier's McArthur, Breitenbach join Mayor Leaphart, plant manager Stein at community barbecue.

No Carpetbagging Here

Moving a large plant into a small southern community unaccustomed to big bustling industry brings a passel of problems for management, as many chemical companies are learning today. But that one large manufacturing firm has solved its community relations problems auspiciously was evident when Rayonier, Inc., the nation's largest producer of chemical cellulose, formally inaugurated its $25-million mill at Jesup, Ga., 68 miles southwest of Savannah, by holding open house for its new neighbors.

More than 5,000 people from miles around came to tour the plant, to hear Governor Herman Talmadge praise the new mill for the boost it would give the utilization of Georgia's pine wood resources, and to partake of a giant barbecue—Georgia style, with all the trimmings. Even a brief downpour during the dedication ceremonies failed to dampen their enthusiasm.

Clearly, Rayonier had won the accolade of its new neighbors. How? "We knew," recalls Russell Erickson, vice-president in charge of engineering and plant development, "that our first job was to sell ourselves to the people of Jesup."

Candidly Presented: Erickson and other Rayonier officials got together with Jesup's dynamic Mayor Alvin Leaphart, with the commissioners of Wayne County, with young Moffett Kendrick, the alert manager of the Jesup and Wayne County Chamber of Commerce, and with other groups curious about the then-proposed mill. At meetings in the home of Mayor Leaphart, in the homes of other residents, and at public meetings, Rayonier executives candidly told all about their plans for Jesup. Nothing was withheld. As Erickson puts it, "We wanted to find out if this was going to be a honeymoon or a lasting marriage."

One thing that worried local residents was whether a cellulose mill would smell. "We were honest with them," says Erickson. "We said it wouldn't merely smell, it would stink. But if they still wanted us, we'd do everything possible to reduce the odor. They agreed."

Combating Pollution: Rayonier kept its promise. Not only are condensers in the mill overdesigned to minimize odors, but also precipitators on the recovery boilers are 20% over capacity so they can capture up to 98% of the solids—even the minute particles of sodium carbonate to which cling the mercaptans that give a pulp mill its characteristic odor. As a final safeguard, Rayonier has installed an extra high 250-ft. stack—150 ft. would have been high enough—to dissipate odors rapidly.

Water pollution could have been another sore spot. The Altamaha River, into which effluent from the mill flows, is a favorite of fishermen and a source of water for downstream communities. So Erickson conferred with William Weir, Georgia's director of water pollution control, and at his suggestion had the National Council for Stream Improvement make a stream survey. (It took over a year.) Meanwhile, Rayonier encouraged fishermen and hunters to lodge any dissents before the company decided to build the mill. None did so.

In the mill itself, the brown-stock washing system has been overdesigned to take out virtually all the lignins and other chemicals, and the discharge of mill effluent is automatically controlled. To guard further against contaminating the river, Rayonier has constructed a 45-acre lagoon so outflow can be governed, effluent given time for oxidation and settling.

Housing might also have been a thorny problem, but luckily for Rayonier—which did not want to get into the housing business—new projects are providing low-cost housing for purchase or rental. More than 148 new dwellings have already been built, mostly five-room houses that rent for as little as $60 a month, sell for $8,500. This has eased the worry of plant manager Thomas Stein, who feared that hourly workers—many of whom are newcomers—would have difficulties lining up living quarters. For management men and technical men arriving from other Rayonier plants or coming from other jobs, the problem isn't so acute. Many are buying or building their own homes in Jesup.

Growing Pains: "We suddenly had more than 900 new students for our grade schools and high school," says Mower "Nick" Nichols, Jesup school superintendent. "But Wayne County put up a $300,000 bond issue, and we built two new grammar schools, one for the white children and one for the colored. Now both are being expanded." Also planned: a $1-million building program for the high school with state financial backing.

Police Chief Thomas Crosby has doubled his force to six men. And Jesup has a shiny new red fire engine (that cost $10,000) and which Fire Chief Kennic Yeomans and his two regular firemen polish lovingly.

Seven miles of street have been paved. A new waterworks and sewage system, together costing $600,000, are being built.

Rayonier is carrying its share of the cost of these and other services its 450 employees require of the community. It sought no tax relief or other special incentives. "We asked for and got," says Erickson, "equitable valuation. After all, we wanted to eat out of the same spoon as everyone else."

Business Booming: Today Jesup no longer drowses in the sultry heat by the slow-moving Altamaha River. Its population is up from 4,600 in 1950 to more than 5,800 now and is still growing. More than 400 building per-

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mits have been issued since 1950. Four new churches have been built. A new bank, Jesup's second, and a building and loan office have opened. Sixteen new stores are in business.

The mill payroll is $2 million/year, and Rayonier will spend as much again in the immediate area for timber and services. For local merchants this means a new era of prosperity. Perry Collins, cashier at the newly opened Wayne State Bank, who moved from Vidalia, Ga., 60 miles away, estimates the weekly mill payroll is already about $40,000 and is turning over three times a week. "You can't turn that much money loose without people feeling it," chimes in druggist Ernest Knight.

"It's just beginning to hit," enthusiastically declares Tindall Littlefield, furniture dealer and president of the Chamber of Commerce, "the first pay checks are coming in now. It's wonderful."

Newcomers Adapt Easily: "There must be close to 350 people in Jesup working in the mill," Littlefield goes on. "Some were here before," he says, "but many came in from other places. It's amazing how quickly they get acquainted. I'm strictly a native—my father and mother were born here—but I welcome people like these that Rayonier is bringing in. They're really nice families. You meet them at church, some teaching Sunday school, or at the Kiwanis Club—everywhere. They're becoming part of Jesup."

Echoing his sentiments is one of Jesup's newcomers, James Challas, mill superintendent, who hails from Cloquet, Minn. So satisfied with conditions that he's already designed and built his own home, Challas notes that there has been no clannishness of Rayonier's office, mill and laboratory personnel. "Oldtimers and newcomers are all in PTA activities together, are sharing in a number of community projects. The climate's good for children, too. You live in northern Minnesota seven years, and you're glad of a change."

Rayonier is convinced that its efforts to make friends of its new Georgia neighbors have been worthwhile. So much so that what began spontaneously and proved so successful will be formalized as an important future part of the company's industrial relations function.

There's no universal formula for establishing solid community relations—that company executives realize. But the pattern of handling affairs at Jesup has worked so well for Rayonier in Georgia, the company's sold on making the procedure standard practice elsewhere.

Holding the Line

Despite all the hullabaloo to the contrary, the government's titanium expansion target remains at 35,000 tons by 1957. Main reason: firm military requirements—tabulated up through 1958—actually add up to less than the currently planned goal.

The government's stand in the matter, however, may come as a surprise to chemical men well aware of the dramatic military and aircraft industry talk about 150,000-ton annual requirements and Sen. Malone's (R., Nev.) recommendation that the government's expansion target be set at that figure "without delay."

Adding further to the excitement over titanium: Dow's official entrance into the picture last week when the General Services Administration signed a purchase contract to buy 1,000 tons of its new-planned output.

Other chemical companies have purchase contracts too:

- Du Pont—about 7,500 tons.
- Electro Metallurgical Co.—also 7,500 tons (cut from 10,000 tons).

Providing still greater interest: a cash advance to Monsanto Chemical Co. for construction of a pilot plant, and the signing of a process evolution pact with Horizons Titanium Corp. (*CW, Newsletter, July 10*).

GSA admits there may be additional pilot plant grants later on, but now insists that it will not subsidize any commercial capacity beyond the 35,000-ton limit "unless a basically new process is suddenly proved economically feasible."

Joining the Ranks

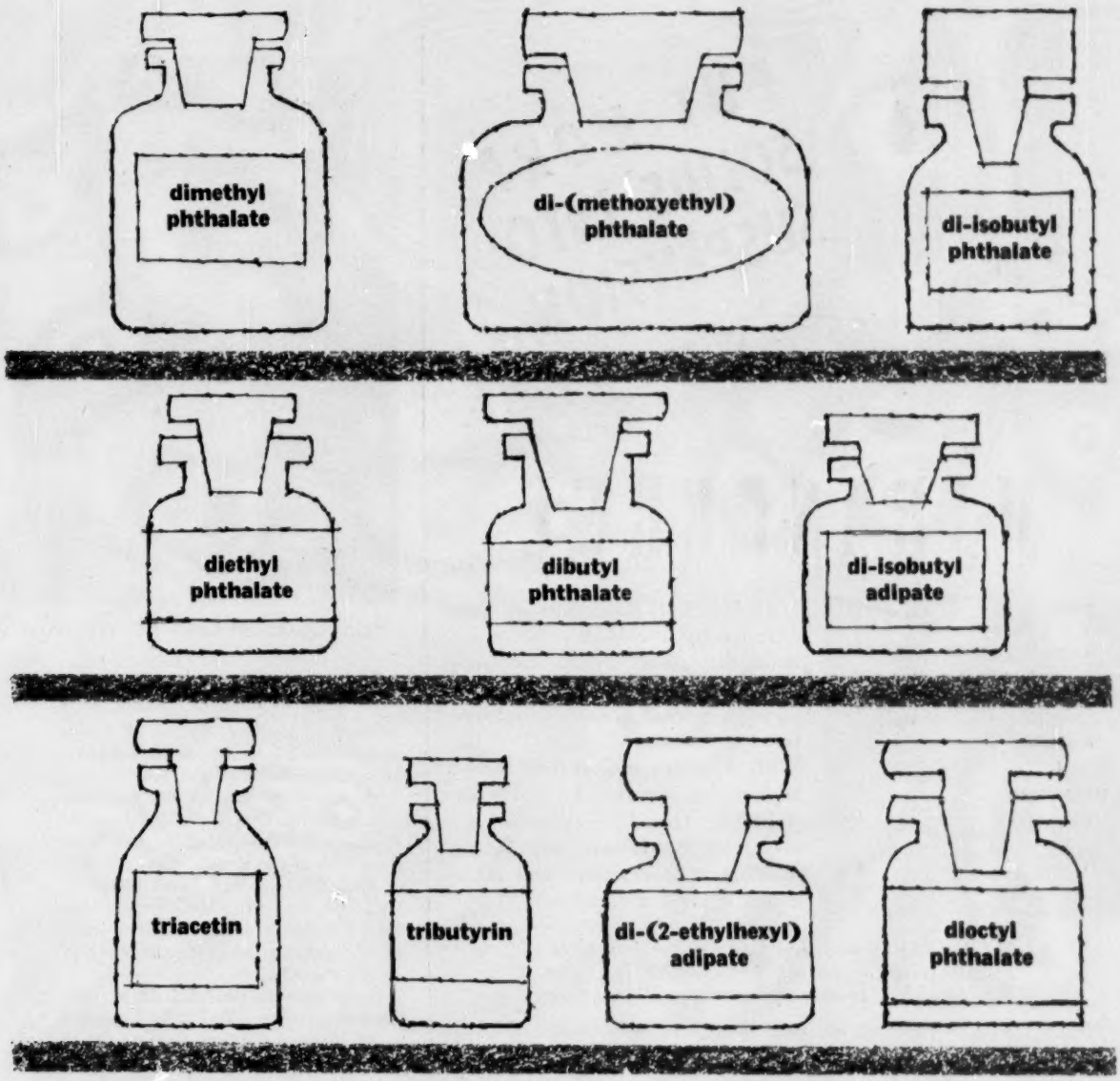
Hilton-Davis Chemical Co. (a subsidiary of Sterling Drug Inc.) is the latest U.S. chemical concern to reveal plans to build a foreign plant in cooperation with an off-shore partner. Its co-sponsor: Amritlal and Co., Ltd., Bombay; the product: textile dyestuffs.

Present plans call for construction to start sometime this summer; the plant site is located some 50 miles from Bombay.

Hilton-Davis executives say that under terms of the agreement, the plant, when in operation, will be operated by Amritlal under the corporate name Amar-Dye Chem, Ltd. Financial transactions have not yet been revealed.

Smiths, Joneses and Carbon Black

NOT LISTED, but a vital factor in the new Manhattan telephone directory, are the chemicals required for its manufacture. Here are the surprising statistics. To produce a million and a half copies it takes 4,000 tons of paper, 5,000 gal. of glue and 13,000 gal. of ink. Paper for inside pages is 70% groundwood, 30% sulphite pulp; cover stock is 100% sulphite board. The glue is a polyvinyl acetate copolymer in water emulsion. Ink contains 15% carbon black in a resin-mineral oil varnish. A special type of black obviates need for toner.



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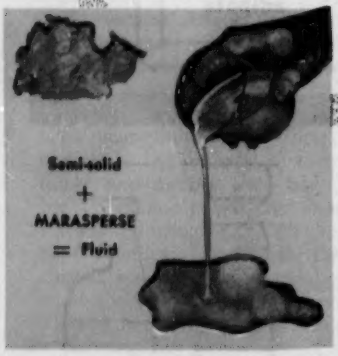

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GAS-COKE PICKETS AT ATOMIC PLANTS:

LABOR . . . . . .

Injunction Avoided: President Eisenhower was all set to use the national emergency clause of the Taft-Hartley labor law when some 4,500 members of the United Gas, Coke & Chemical Workers (CIO) decided to return to their jobs at the atomic energy plants in Oak Ridge, Tenn., and Paducah, Ky., pending further negotiations with Carbide and Carbon Chemicals, which operates the plants as contractor for the AEC.

Picketing was peaceful during the three-day strike, called to back up demands for a wage increase first set at 21¢/hour, then trimmed to 15¢. The company was offering the 6¢ rise retroactive to April 15, as recommended by the Atomic Energy Labor Panel; but both Gas-Coke and the other union concerned—the Atomic Labor Trades (AFL), representing another 4,500 Oak Ridge employees—refused to accept that finding.

"Let your conscience be your guide," was what Gas-Coke pickets were telling people who sought to enter the plants (*see cut, above*). Wage rates now range from $1.58 to $2.40/hour at the two sites. Carbide and Carbon was able to keep the plants in production, using supervisory and other salaried personnel to maintain output of uranium-235.

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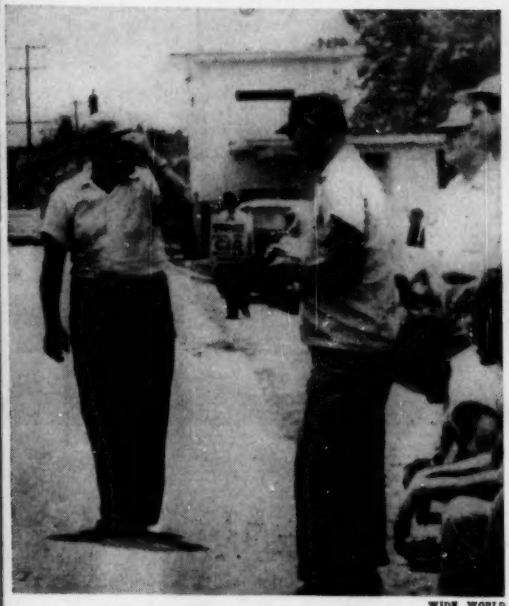
Stauffer Workers Vote: Production and maintenance employees at the new Stauffer Chemical plant in Lemoyne, Ala., have voted in an elec-



WIDE WORLD

Now pausing for new parleys.

tion conducted by the National Labor Relations Board to affiliate with United Gas, Coke & Chemical Workers (CIO).

•

Six-cent Average: Latest chemical wage increases cluster around the 6¢/hour level.

• New contracts negotiated by District 50, United Mine Workers, call for wage rises of 7¢/hour for skilled and semi-skilled employees and 5¢/hour for unskilled workers at the Buffalo (N.Y.) plant of National Aniline Div., Allied Chemical; increases ranging from 5¢ to 7¢/hour for Canadian Industries Limited employees at Nobel, Ont.; a 4% boost (worth 6¢ to 9¢/hour) for production and maintenance workers at the Hercules Powder Co. plant in Hopewell, Va.; and a 6½¢ hourly rise for employees in the Calgon plant at Pittsburgh.

• Three major potash companies have granted a 4¢/hour increase to employees represented by International Brotherhood of Electrical Workers (AFL) at Carlsbad, N.M., and are now negotiating with two other unions representing production employees. Federal Mediator H. H. Atkins predicts the IBEW settlement will be the pattern for other potash wage agreements this year.

• At Barberton, Ohio, Columbia-Southern Chemical has signed a one-year contract with Allied Chemical & Alkali Workers (Ind.) providing for a flat wage increase of 6¢/hour to the approximately 1,500 employees there.

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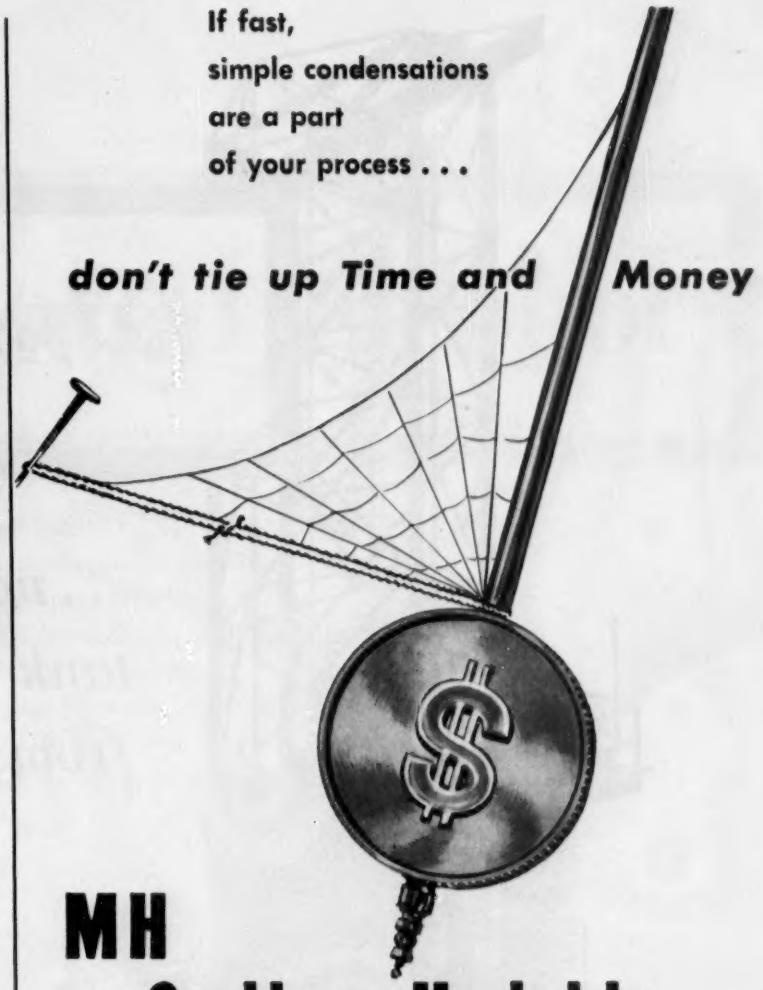

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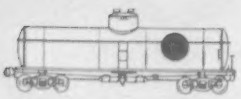

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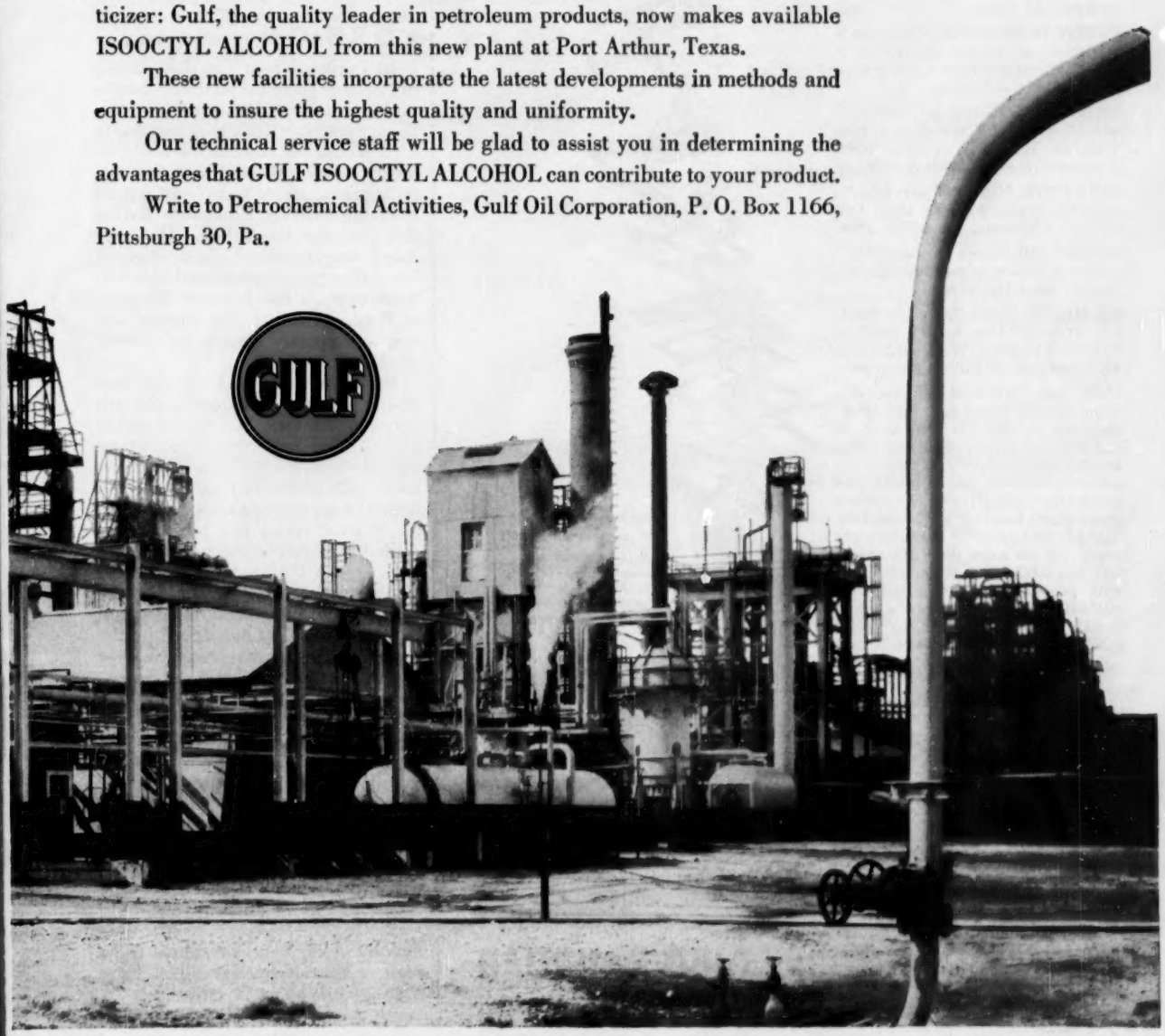

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In the Valley of the Ohio—the "American Ruhr"—is a newly-developed resource-rich section which has attracted companies from the "Blue Book" of American industry. Here the chemical industry alone, with supporting utilities and other related plants, in the past ten years, has invested $750,000,000. on new plants, a stack of dollar bills over 59 miles tall!

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Ammonium sulfate	$63.90/ton
Caustic soda	$120.90/ton
Export Price	
Aluminum	27¢/lb.
Cement	$21.00/ton
Ammonium sulfate	$61.40/ton
Caustic soda	$115/ton

FOREIGN . . . . . .

Dual Pricing/Japan: The dual pricing of Japanese chemical products, despite rapid progress of the country's deflationary policy, is likely to persist due to high production costs of the home industry, and continually high raw material prices, according to latest reports from the *Oriental Economist*. Earlier this year, the International Monetary Fund sought official clarification of the dual pricing system and received word through the Japanese Embassy in Washington that "the phenomenon was a temporary one—in the process of elimination."

But industry sources are less sure of any prospect of narrowing the gap between domestic and export prices as long as current economic conditions prevail. Equipment (for both replacement and expansion) costs are still high; the government's policy in shortening work hours has been accompanied by a recent rise in wages; tax rates are on the upgrade again; and money for financing is scarce in the islands. The retrenched budget and tight money policy introduced by the Japanese government several months ago will probably fail to have the desired effect upon export-domestic price differences; chemical producers will be forced to maintain domestic prices at relatively high levels to cover losses from low-priced exports.

•

Fertilizer/Argentina: The Argentina Central Bank will accept requests until July 27 for the import of an unspecified amount of fertilizer from the "dollar and sterling areas."

•

Sulfuric Acid/Australia: Three large roasters to produce sulfuric acid are nearing completion at Port Adelaide, South Australia. They are part of a

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Emulsion Properties	
Total Solids, %	54-56
Viscosity, cps.	1000-1200
pH	4.0-6.5
Film Properties	
Tensile Strength (lbs/in.²)	2000-2200
Color	Water-White
Light Stability	Excellent
Aging	Excellent
Gloss	High
Melting Range	Above 390°F

For use as above, but with even greater flexibility

DAREX Everflex B

this new vinyl acetate copolymer emulsion produces an internally plasticized film which is softer and more flexible than Everflex A, but is otherwise similar in properties. Everflex B will be of interest where a more flexible film or a softer hand is required than can be obtained with Everflex A.

Emulsion Properties	
Total Solids, %	54-56
Viscosity, cps.	1000-1200
pH	4.0-6.5
Film Properties	
Tensile Strength (lbs/in.²)	1000-1300
Color	Water-White
Light Stability	Excellent
Aging	Excellent
Gloss	High
Melting Range	Above 390°F

For superior water-based paints

DAREX Everflex G

here is a new vinyl acetate copolymer emulsion that is specially designed as a vehicle for water-based paints. Everflex G exhibits superior water resistance, good pigment wetting properties, and excellent film formation even at low temperatures. Like the others in this series, internally plasticized Everflex G is non-aging, non-discoloring, and retains flexibility. Its use is suggested for interior finishes, primers, and exterior masonry paints.

Emulsion Properties	
Total Solids, %	50-52
Viscosity, cps.	300-500
pH	4.0-6.5
Film Properties	
Tensile Strength (lbs/in.²)	2000-2200
Color	Water-White
Light Stability	Excellent
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$5-million acid plant, due for completion early next year, under construction by Simon-Carves (Aust.) Pty. Ltd.

•

Soda Ash/Netherlands: The Dutch Lower House has passed a bill giving the green light for construction of a 52-million-guilder soda industry in northern Holland. Members of the Dutch Labor Party opposed the bill, asked for a greater government share in the project—but were defeated. The project will be financed jointly by private, semiprivate, and state funds.

•

International Exchange: Brazil and Finland will exchange $26 million in goods under terms of a trade agreement signed last year, but made public only late last month. Included in the arrangements: shipment of newsprint and cellulose from Finland to Brazil for manufacturing paper. Value $18.5 million.

•

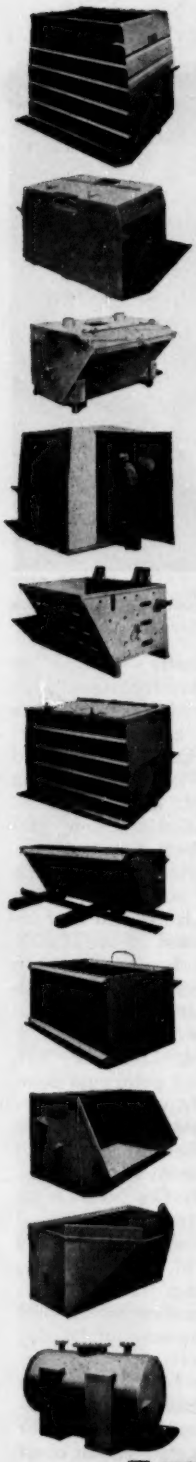
Natural Gas/Great Britain: Britain's $3-million search for domestic sources of natural gas may have struck pay dirt after only six months of exploration. A well in Sussex, near Ashdown Forest, has brought in gas at a depth of less than 700 ft. It's too early to tell how extensive it is, or even if it's economically feasible, but Gas Council officials are openly jubilant over the strike.

LEGAL . . . . . .

Fatter Fines: With the Justice Dept.'s antitrusters casting a searching eye at newly expanded industries in the South and West for possible Sherman Act violations, the National Assn. of Manufacturers is taking a particularly active interest in proposed changes in the nation's antitrust policies. Latest instance: NAM General Counsel Lambert Miller has written to Sen. William Langer (R., N.D.), who heads the Senate Committee on the Judiciary, to protest against H.R. 2237, a bill that would increase maximum fines under the Sherman Act from the present $5,000 to a new upper limit of $50,000.

"Despite more than 60 years' enforcement of the Sherman Act, businessmen have not yet been provided workable guides on legality of normal business activity," Miller asserts. "It is our belief that Congress should give attention to clarification of the law before increasing 10-fold the amount by which a businessman can be fined for conduct that may be declared to be illegal only after the fact."

NAM also has published a pamph-



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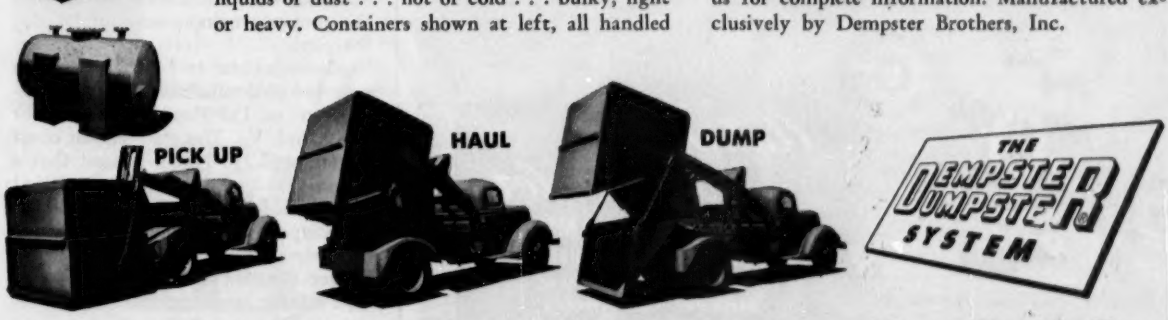
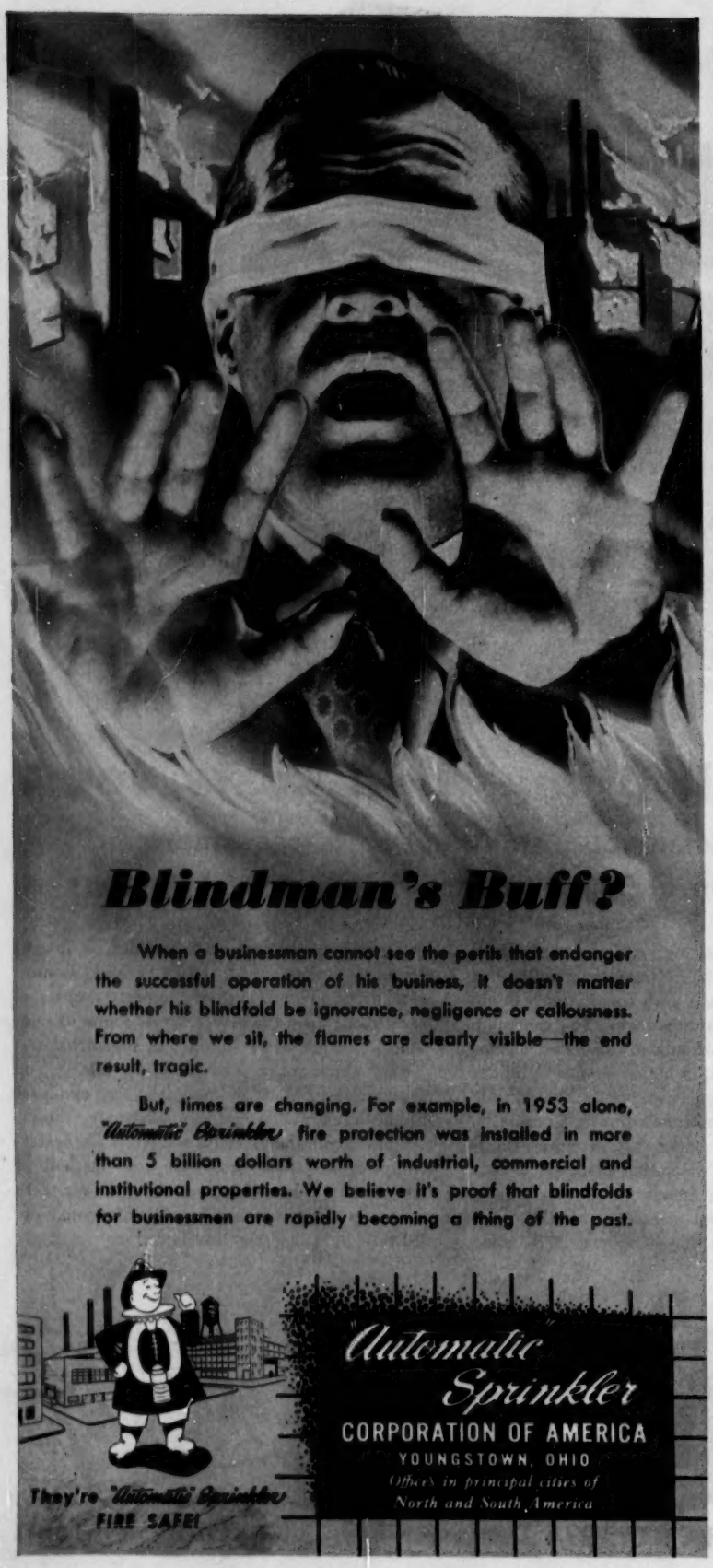


DEMPSTER BROTHERS, 274 Dempster Bldg., Knoxville 17, Tenn.


Blindman's Buff?
When a businessman cannot see the perils that endanger the successful operation of his business, it doesn't matter whether his blindfold be ignorance, negligence or callousness. From where we sit, the flames are clearly visible—the end result, tragic.
But, times are changing. For example, in 1953 alone, "Automatic" Sprinkler fire protection was installed in more than 5 billion dollars worth of industrial, commercial and institutional properties. We believe it's proof that blindfolds for businessmen are rapidly becoming a thing of the past.
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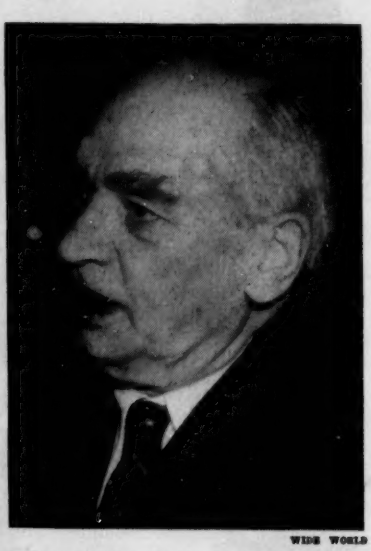

WIDE WORLD

SEN. LANGER: From NAM, a plea for clarity before costlier castigation.

let called "Industry's View on Monopoly." In it, the association recommends that jurisdiction over "antimerger" cases and alleged interlocking directorships be transferred from the Federal Trade Commission to the Justice Dept., leaving to FTC unlawful price discrimination and other unfair practices.

Word from Washington is that the Justice Dept. has set up a "roving field office" to comb through new industrial regions, and that already enough complaints have come in to justify an extended investigation in the New Orleans area.

•

Annexation Balk: At Louisville, Ky., several chemical and petroleum companies have brought suit in state circuit court to oppose the city's move to annex the "Rubbertown" area that includes those companies' plant sites. Among the plaintiffs: Goodrich Chemical, Du Pont (neoprene), Bond Brothers (wood preserving), Reynolds Metals, Standard Oil (Ky.), and Ashland Oil & Refining. Their petition contends that annexation would hurt the property owners without helping the city.

Also reluctant to be included in a new political subdivision is the management of Du Pont's facilities near Richmond, Va. The state circuit court has granted Du Pont's request that a hearing on creation of the proposed Chesterfield County Sanitary District be postponed. It's planned to assess property owners in that district to finance construction and operation of a $2-million sewerage system.

•

Money for Melons: An insecticide

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Here are some of the individualized intermediates available through Michigan Chemical Corporation, in either test or production quantities. All chemicals are of highest quality, produced under control of our research and analytical laboratories, backed by 20 years experience. For complete information on specifications, description and properties of these and other intermediates, just write for our booklet "Individualized Intermediates".

Pestmaster* Methyl Bromide. A heavy, colorless liquid; non-inflammable and poisonous. Highly penetrating and insecticidally effective. Also used in organic synthesis for the introduction of the methyl group, especially in preparation of certain pharmaceutical chemicals.

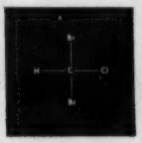
HBr

Hydrobromic Acid. A clear, colorless or light amber colored fuming liquid. Used for manufacture of inorganic metal bromides, aliphatic bromides, pharmaceuticals, dyes and intermediates. 48% acid and other strengths as desired, in glass.

Ethyl Bromide. A clear, colorless, volatile liquid, specially prepared for use as an intermediate in organic synthesis. Practically free from impurities; has a narrow boiling range. Used in manufacture of dyes, perfumes and pharmaceuticals, especially barbiturates.

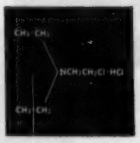
Monobromobenzene. Clear, colorless, heavy liquid. Specially prepared for use as an intermediate in preparation of organic compounds. For introduction of the phenyl radical and in Grignard-type reactions. A pure material with a 4 degrees C. boiling range; specific gravity 1.495.

Bromotrichloromethane. A clear, colorless, heavy liquid with a chloroform-like odor. Specific gravity 2.0; boiling point 104 degrees C. Miscible with many organic liquids. Useful in organic synthesis, forming adducts with olefins with peroxide catalyst.

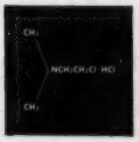


Dibromochloromethane. A clear, colorless, heavy liquid similar to bromodichloromethane. Used in organic synthesis, forming adducts with olefins under the influence of peroxide catalysts. Specific gravity 2.38; boiling point 116 degrees C.

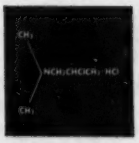
Cyclopentyl Bromide. A clear, colorless liquid with an aromatic odor. Specially prepared for use in organic synthesis, particularly for introduction of the cyclopentyl radical. Many potential uses in manufacture of pharmaceuticals. Purified grade, 2 degrees C. boiling range.



β-Diethylaminoethyl Chloride Hydrochloride. (DEC). $(CH_3CH_2)_2$ N CH_2 $CH_2Cl \cdot HCl$. A granular solid. Specially suited for use as an intermediate in organic chemical manufacture, including the manufacture of antispasmodic agents and other pharmaceuticals.



β-Dimethylaminoethyl Chloride Hydrochloride. (DMC). $(CH_3)_2$ N CH_2 $CH_2Cl \cdot HCl$. A granular solid. Specially prepared for use in manufacture of antihistaminics and other pharmaceuticals. Other potential uses in organic synthesis. Relatively non-toxic in Hydrochloride form.



β-Dimethylaminoisopropyl Chloride Hydrochloride. $(CH_3)_2$ N CH_2 CHCl $CH_3 \cdot HCl$. (DMIC). An organic intermediate similar in appearance and properties to DEC and DMC. Specially prepared for manufacture of analgesics and other pharmaceuticals. Other potential uses in organic synthesis.

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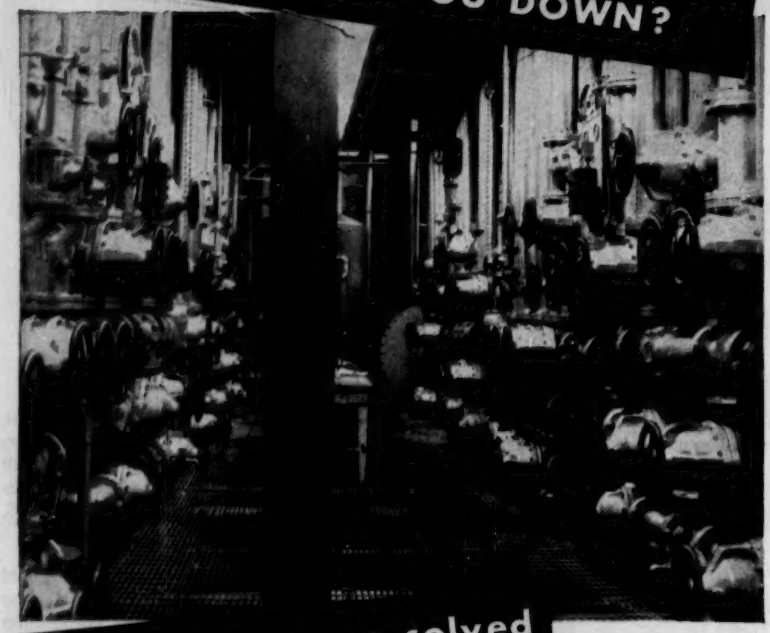

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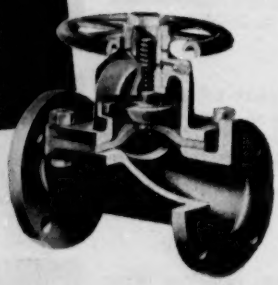

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V-11

B & I . . . . . .

dealer in Arizona must know exactly which product to prescribe in every situation, it appears this week. That state's supreme court is holding the Wilbur-Ellis Co. of Glendale liable for $10,000 as damage to a canteloupe crop adjacent to a cotton field sprayed with that company's insecticide. The court found that the insecticide was sold with the knowledge that it was to be used on a field near the melon crop and that its sulfur base was injurious to the melons.

•

Paint, Wax, AD-X2: Industry-policing activities of the Federal Trade Commission are in the news in the North, South and West this week.

• Nearly 200 paint and wallpaper dealers in metropolitan New York City have been accused of conspiring to use unfair trade practices and unfair methods of competition. FTC investigators said members of a paint dealers' association had tried to deter manufacturers and suppliers from selling to stores not regarded as "legitimate" dealers. Hearing date has been set for Sept. 13.

• At Tallahassee, Fla., the Freewax Corp. has agreed to change advertising claims to which FTC had objected. The company will stop representing that its insecticidal floor wax affords freedom from insects.

• Unusual speed on the part of FTC now makes it likely that hearings on battery additive AD-X2 will begin July 26. Earlier, procedural maneuvers by AD-X2 manufacturer Jess Ritchie and his Pioneers, Inc., of Oakland, Calif., had threatened to delay hearings until September or later. FTC last week supported its hearing examiner, William Pack, and rejected attempts by Pioneers to use as part of its answer to the charges a whole transcript of Congressional hearings on the 1953 wrangle between Ritchie and the National Bureau of Standards.

KEY CHANGES. . .

Julian A. Space, Jr., and **J. C. Berry,** to directors, Chemical Enterprises, Inc., New York City.

Walter A. Steiner, Arthur C. Bryan and **William H. Feathers,** to vice-presidents, National Carbon Co., New York City.

Cecil R. Mozley, to manager, Southern Div., Ciba Pharmaceutical Products, Inc., Summit, N.J.

James A. Wilson, to production manager, Phosphate Chemicals Div., International Minerals & Chemical Corp., Chicago.

Dependable Source for Chemical Raw Materials

Leonard A. Pierce, Jr., mill manager (right), discusses a procurement problem with Jack W. Hartung, purchasing agent, St. Regis Paper Company, Kalamazoo, Mich.

How Wyandotte helps St. Regis make top quality papers

The Kalamazoo mill of the St. Regis Paper Company specializes in coated and uncoated printing and specialty papers, and Panelyte decorated products. Their products are among the finest being made . . . therefore, they require the best raw materials available. St. Regis uses Wyandotte CAUSTIC and CHLORINE in processing, and Wyandotte PURECAL* in their finishing operations.

At one time, they used a calcium hypochlorite bleach, but found the lime residue a distinct disadvantage. With the help of Wyandotte technical service, they changed over to sodium hypochlorite, and not only eliminated lime deposits, but got better quality as well.

The Kalamazoo mill of St. Regis Paper has made considerable use of Wyandotte's technical services in the use and handling of chemicals, and they have expressed their satisfaction with the co-operation they receive from Wyandotte, particularly in times of short supply.

Wyandotte owns its sources of raw materials . . . is centrally located, convenient to all forms of transportation . . . and has a background of more than 64 years of service to industry. If you use raw-material chemicals, or need assistance in their use or handling, contact Wyandotte. Stating your problems in detail will expedite our services to you. *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Offices in principal cities.*

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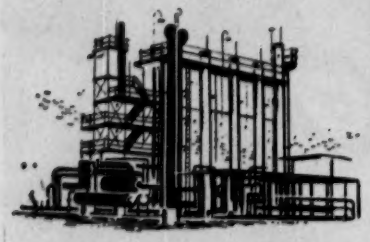
Calcium Carbonate • Calcium Chloride • Glycols • Synthetic Detergents • Agricultural Insecticides • Soil Conditioners
Other Organic and Inorganic Chemicals

PROBLEM

To produce hydrogen essentially free of carbon monoxide which has a deleterious effect on product quality and plant capacity for edible oil producers.



SOLUTION

GIRDLER developed a highly active durable catalyst, G-12, for removal of carbon monoxide from the hydrogen. Cost of hydrogen production was reduced and carbon monoxide content was cut 95% resulting in:

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SPECIALTIES . .

AFTER DINNER WASH-UP: Cleanliness creates its own problems.

Synthetic Sore Spot

"**Don't let harsh detergents** wash your hand beauty down the drain! Red, rough 'detergent hands' look lovelier in 24 hours or your money back!" So reads an ad for a well-known hand lotion.

Seeing the expression "detergent hands" in print must make many detergent manufacturers frown. However, even they occasionally go in for a similar line. Example: Colgate-Palmolive has consistently advertised its Vel as "a miracle of mildness" because it caused no "detergent burn."*

About the only conclusion readers of such ads can reach is that American housewives are having a hard time of it. Actually the situation is not too bad, but it could be better. Reason: toxicity of soap and synthetic detergent mixtures has created a real problem—perhaps a growing one.

Second To Food: It's not hard to understand why the problem exists. Because they are used daily by millions of people, detergents—that is, any chemical materials that have the property of cleansing—have an exposure factor greater than any other class of consumer products with the exception of food.

Furthermore, were consumers less determined to be clean and to have clean things, the problem would not be as large as it is. And because they seek cleanliness, they have bought more and more products that do a better job.

That's why the market for synthetic detergents (not based on soap) has grown at such a fantastic rate. To illustrate, amount used has increased from less than 1 lb./per person in 1942 to over 10 lbs./per person. About two-third of the packaged household washing products sold today are synthetic detergents.

Many Possibilities: This climb in consumption has prompted plenty of interest in detergent effects on skin. Studies have revealed that the main cause of toxicity or irritation by detergents is a high pH, which results from normal or excessive amounts of free alkali—derived primarily from the hydrolysis of the detergent when in aqueous solution. Toxicity may also stem from fatty acids, "builders", dyes, preservatives, perfumes, bleaches, germicides and medicinal agents. Because manufacturers frequently alter the composition of detergents, dermatologists often have trouble deciding what the causative irritants are.

In the majority of people, of course, there is no irritation. But sensitive skin

* A light-duty type of synthetic detergent, Vel, like most others, is based on alkyl aryl sulfonate. Heavy-duty types contain "builders" (usually tripolyphosphate in concentrations of 35-50%) that make neutral products highly alkaline.

may suffer from dryness, scaling, itching or burning. There are two ways a product may be injurious—as an irritant or as an allergenic sensitizer. A primary irritant causes inflammation (dermatitis) on its first contact with the skin. Cutaneous sensitizers cause dermatitis only after a second contact when applied at least five days after the first contact. (Once the skin is sensitized, at some future date—weeks, months, even years—another contact is likely to cause an eczematous inflammation because the epidermal cells are now allergic to the product.)

Pertinent Points: Here are some points noted by Dr. Louis C. Barail, a consulting biochemist-toxicologist:

- Blondes are more susceptible than brunettes.
- White males are more susceptible than white females.
- Negroes are least susceptible to skin irritation.
- Oily skins are less susceptible than dry skins.
- Excess perspiration increases chances of dermatitis and makes existing dermatitis more severe.
- Potash soaps have been found to be more irritating than soda types.
- Most antiseptics added to soap are primary irritants and cutaneous sensitizers.
- The presence of dyes and essential oils increases the irritating capacity of detergents.
- Dermatitis frequently occurs when liquid or powdered soaps are applied on hands and arms with an insufficient amount of water, thus bringing the concentration of soap much above normal.

Observations made by Dr. Irwin I. Lubowe, medical consultant for clinical evaluation and toxicology:

- In the cationic group of synthetic detergents, the quartenary ammonium compounds are foremost in their damaging action in higher concentration than 1%.
- In the anionic group, the alkyl lauryl sulfonates are irritating above 5%, the sodium lauryl sulfates above 20%.
- In the nonionic group, the ethers of polyethylene glycol tend to irritate above 5%, the fatty acid amides above 10%.

Respected Report: While there are both pessimists and optimists on the subject of toxicity of synthetic detergents, probably the most level-headed conclusions are contained in the Interim Report of the Committee on Synthetic Detergents published in Great Britain earlier this year by the Ministry of House and Local Government. Appointed in 1953 to investigate the effects of the increasing use of "syndets," the committee observes:

"... the evidence so far shows that despite the widespread use of synthetic detergents throughout the country the incidence of dermatitis is not significantly greater than it was when soaps and alkalies, or preparations based on them, were the only common washing products."

To prevent irritation, the committee states, "It is important, in our view, that whatever type of washing product is used the hands should afterwards be thoroughly rinsed in fresh water and dried; it would be helpful if the manufacturers stressed the advantages of this in the instruction on the containers.

"It would also be helpful if some means could be found to educate housewives as to the quantities of synthetic detergent preparations necessary for particular purposes, for it is probable that the slight existing risks of dermatitis arise less from merely using them than from their excessive use."

Less Impressive: Yet there is no room for complacency. A recent report by a magazine devoted to evaluating consumer producers stated that out of 19 leading brands of toilet soaps, only two met federal specifications and had a low oil content. Eleven others, while meeting federal specifications, contained coconut or palm-kernel oil or both in excess of 20% of their total fat content—an amount that dermatologists regard as excessive. As for the remaining ones, they failed to meet federal specifications on one or more requirements.

But regardless of the red hands in the homes, there are a lot more in industry. In fact, soaps and alkalies are rated among the leading causes of occupational diseases, which costs industry $100 million annually. Diseases of the skin constitute some 60% of the total and soaps and alkalies make up the biggest proportion of this figure. The explanation: hand cleaners for industry are often crudely made.

All of which indicates that manufacturers must continue to improve their products by (1) tracking down materials having irritating and sensitizing properties via toxicological studies, and (2) eliminating these materials. But consumers must share responsibility, too. They can do their part by not overusing detergents and by choosing those friendly to their skins.

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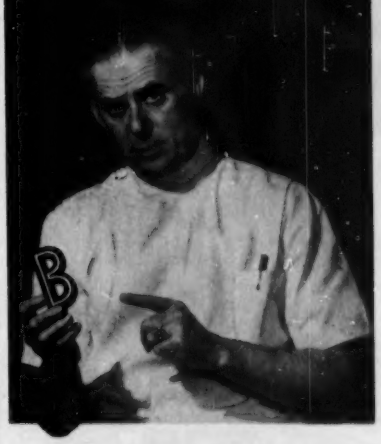

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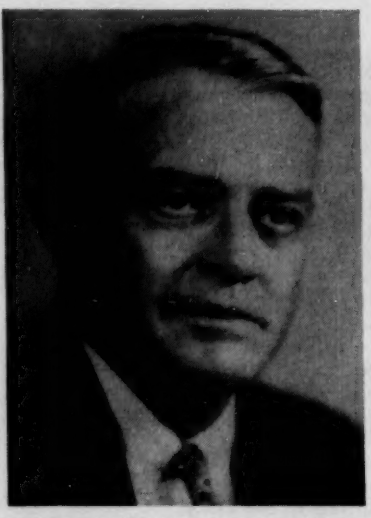


FDA'S CRAWFORD: For antibiotics makers and users, $5 million insurance.

Checkup that Chafes

Under fire again now is Section 507 of the Federal Food, Drug & Cosmetic Act. That's the part that requires that every batch of certain antibiotics be government-checked (at industry expense) for purity, potency, etc.; and that's the part that drug makers, packagers, and formulators are hoping to change.

Already, the American Drug Manufacturers Assn. says, the law has tapped the industry for $5 million, and current certification costs are running about $800,000/year. But more to the point, ADMA says, is the fact that this checking's unnecessary—that the record compiled by drug firms shows that any need for the federal testing is now gone.

Presently, penicillin (not, however, sodium penicillin salts, as such) streptomycin, chlortetracycline, chloramphenicol and bacitracin are under certification rules. Oxytetracycline, neomycin, viomycin, erythromycin, carbomycin and polymyxin are not. They are marketed under the regular FDA "new drug" procedure (*CW, Jan. 31, '53*).

Here's the record of the antibiotics, as summed up by ADMA from FDA files on certification. (The association requested and got this data from FDA last December, in order to evaluate the procedure. Data cover certification period Sept. '45-April '53.).

- Penicillin. Rejection for all causes, 0.68%. Since Jan., '49, rejection has dropped to a 0.3% rate. Since Jan., '50, there have been no rejections on grounds of low penicillin G content, clarity, stability, toxicity, crystallinity, and units per milligram. Most of the rejection for potency also occurred before 1950. Sterility rejections did not go down at the same time, according to the study, but ADMA points out that tests were toughened about this time.
- Streptomycin, dihydrostreptomycin: Over-all rejection rate, 0.62%. Since Jan., '50, it has been 0.35%.
- Bacitracin. 0.53%.
- Aureomycin (chlortetracycline): Rejection rate 0.34% (and it would have been about half this except for the histamine test—"physiologically questionable"—says ADMA).
- Chloromycetin (chloramphenicol): no rejections.

This is a pretty good record, and one that will probably preclude any extension of FDA antibiotic certification. But whether it will get the FDA out of certification entirely is as yet questionable, especially as long as Commissioner Charles Crawford has a say in the subject.

Varied Attitudes: Crawford's staunch backing of section 507 has characterized his leadership of FDA. There has been considerable talk, however, that he may retire soon—and his likely successor (a prediction based on the big "if" that promotion from "within," long an FDA policy, will continue), Deputy Commissioner George Larrick, has not been shown to be as firmly in favor of the law.

Since FDA is in Mrs. Oveta Culp Hobby's Dept. of Health, Education and Welfare, policy changes could originate there, too. And she has tended to call in outside experts to survey the activities of HEW's bureaus and departments. One outside committee is the Hoover Commission, and it has appeared fairly receptive toward ADMA suggestions.

On the other hand, another group of experts might be called in, which could conceivably not only disagree with any idea of decertification, but also suggest even broader regulations.

Not All Bad: And despite the seemingly united action of pharmaceutical manufacturers, there is some feeling within the industry that perhaps the FDA checkup is not such a bad idea. Offered as some good points about the regulation:

- It has promoted a better feeling between industry and FDA—the government can be regarded more as a cooperative agency, rather than as a policeman.
- Despite the $5-million cost*,

* Although an average of 11,000 batches of antibiotics are being processed yearly now, average costs per batch are hard to arrive at, since the amount of testing varies widely with the end use of the drug.

there is no estimate on how much—in dollars and in public esteem—the regulation has *saved* the industry.

• Laboratories of the FDA that do the testing also do other types of testing for pharmaceutical firms at low cost—often lower than a firm could set up labs to do the work for itself.

These pros and cons illustrate just some of the points that must be considered by those contemplating a switch in FDA policy. The variance of opinion in both government and industry hints that it will be some time yet before any striking changes in the regulation are made (they would have to be made by Congress, anyway,—probably along the lines suggested by the HEW department). Meanwhile, there's still plenty of discussion as to whether the $5 million expended so far has been an expense or an insurance policy.

•

Mice Killer: Warficide, the water-soluble form of warfarin sold by the d-Con Co., Inc. (Chicago) is now being introduced in retail consumer channels; its sale has been limited to the grain and cereal industry. The rodenticide is packaged in envelopes (39¢) suitable for making one quart of rat- and mice-killing drinking water.

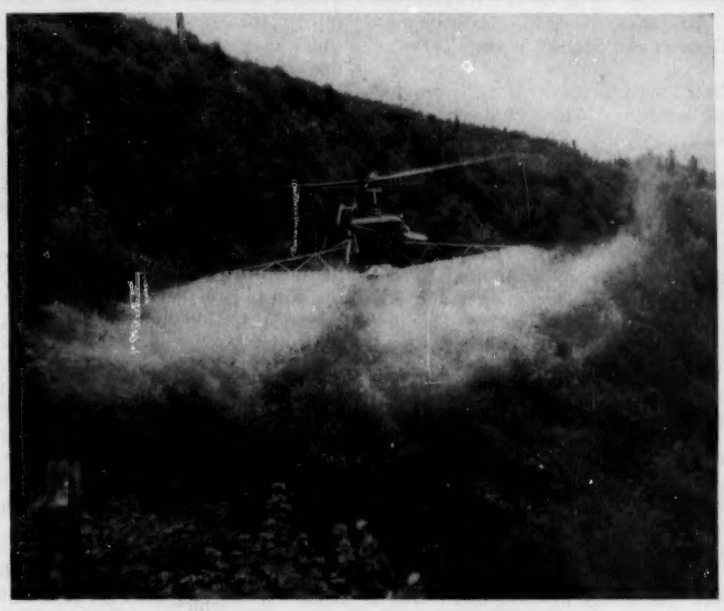
•

Room for Growth: Several firms have recently increased their distributorships, or added new facilities. Among them:

• Pennsylvania Salt Mfg. Co. has just broken ground near Chicago Heights, Ill., and at Delaware, O., for regional packaging and distribution centers for its specialty products division.

• Standard Chemical Products, Inc.'s new $750,000 plant for the manufacture of textile chemicals has been completed in Charlotte, N.C., except for the installation of some equipment.

• Clorox Chemical Co. has opened a manufacturing plant at Seattle, Wash., to produce bleach and household disinfectant for distribution in



Herbicides Help Reforestation

WITH HELICOPTERS replacing Stearman biplanes for the spraying job, commercial use of herbicides in tree farming is now a practice of Weyerhaeuser Timber Co. Weyerhaeuser began its experiments with high concentrations of 2,4-D and 2,4,5-T several years ago (*CW, Nov. 1, '52*), on the theory that the weedkillers would remove brush that might otherwise choke out fir seedlings—fir, with its oily, needle-like foliage, is much less susceptible to herbicides than are broadleaf plants.

Field tests have borne out the theories. On 300-acre plots south of Tacoma, Wash., alders, maples and brush are dying, and conifers are growing lustily.

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• Metalphoto Corp. (Cleveland) has acquired rights to make and sell the photosensitive, anodized aluminum sheets originally developed by Horizons, Inc. The sheets can be used for photographic reproduction, using standard darkroom techniques, and have been used to make name plates, dial and watch faces, etc.

• Peerless Photo Products, Inc. (Shoreham, N.Y.) is now distributing the photocopy equipment and materials made by F. G. Ludwig, Inc. (Deep River, Conn.). Ludwig makes the Contoura-Constat transfer-process device and supplies.

• Builders Supply Co. (Cincinnati) now distributes the bacteriological products made by Fermex Co., (Newark, N.J.), for septic tanks and cesspools.

• Ciba Pharmaceutical Products, Inc. (Summit, N.J.) has expanded its sales program: a new Southern division has been set up, headquartered in Atlanta, Ga., and five sales districts have been added—in Washington, D.C., Jacksonville, Fla., Minneapolis, Denver, and Seattle, Wash.

•

Heft Pays Off: Lever Bros. is promoting its Rinso White and Rinso Blue with an "I-prefer-in-25-words-or-less" contest, the winner to receive the dollar value of her weight in gold—gold is currently $510.40/lb.

•

Colorado Comment: A pair of recent happenings in Colorado hold significance for insecticide makers and appliers:

• Denver's city council has passed an ordinance licensing and regulating commercial sprayers with power equipment. Apparently enacted because of possible dangers in use of phosphate-type insecticides, the regulation requires the sprayers to be covered with $20,000 worth of public liability insurance, and $1,000 protection for general property damage.

• And Colorado's war on grasshoppers was pretty much a lost contest, reaching only one-tenth of its goal. Plan was to treat with aldrin about 1,340,000 acres of the state land to control dangerous grasshopper infestation. Cost was about 20¢/acre, to be shared equally by the state, federal government, and individual ranchers. Ranchers, however, seemed unwilling to pay their third, and only about 151,000 acres got the spray. Officials estimate that the reluctance will mean even greater infestation in 1955 than in '54, which has been one of the worst years on record. One agricultural official says "it appears the ranchers just want to get out of the cattle business."

•

Waste for Sale: An effort to turn organic wastes to profit has been started by Southern Organic Fertilizer Co. (Birmingham, Ala.). Sewage will be refined, dried and bagged for distribution.

•

On-the-Spot Choices: Du Pont has just published a new study of consumer buying habits, "Latest Facts about Today's Shopper in Supermarkets." One of the findings: the average housewife makes 7 out of her 10 buying decisions after she enters the store.

•

Cement Coat: To put a decorative, water and flame resistant on wood, masonry, concrete or fiber board, Culberg Asbestos & Cork Co.'s (Chicago) Roc-O-Iite Div. has developed Ceramiseal. The material, a plasticized thermo-setting cement paint, can be applied with brush or trowel.

•

Plastics Boost: Society of Plastics Industry, Inc., in cooperation with *McCall's* magazine, has produced a 19-minute color film strip to promote plastics acceptance by consumers and retail sales personnel. Title for the film: "Out of the Test Tube—Into the Home."

•

Wetter: Cerfak 1400 is the new nonionic surface active agent made by E. F. Houghton & Co. (Philadelphia) for textile wet processing operations. It's said to have long active life—stock solutions can be made up well in advance of use.

•

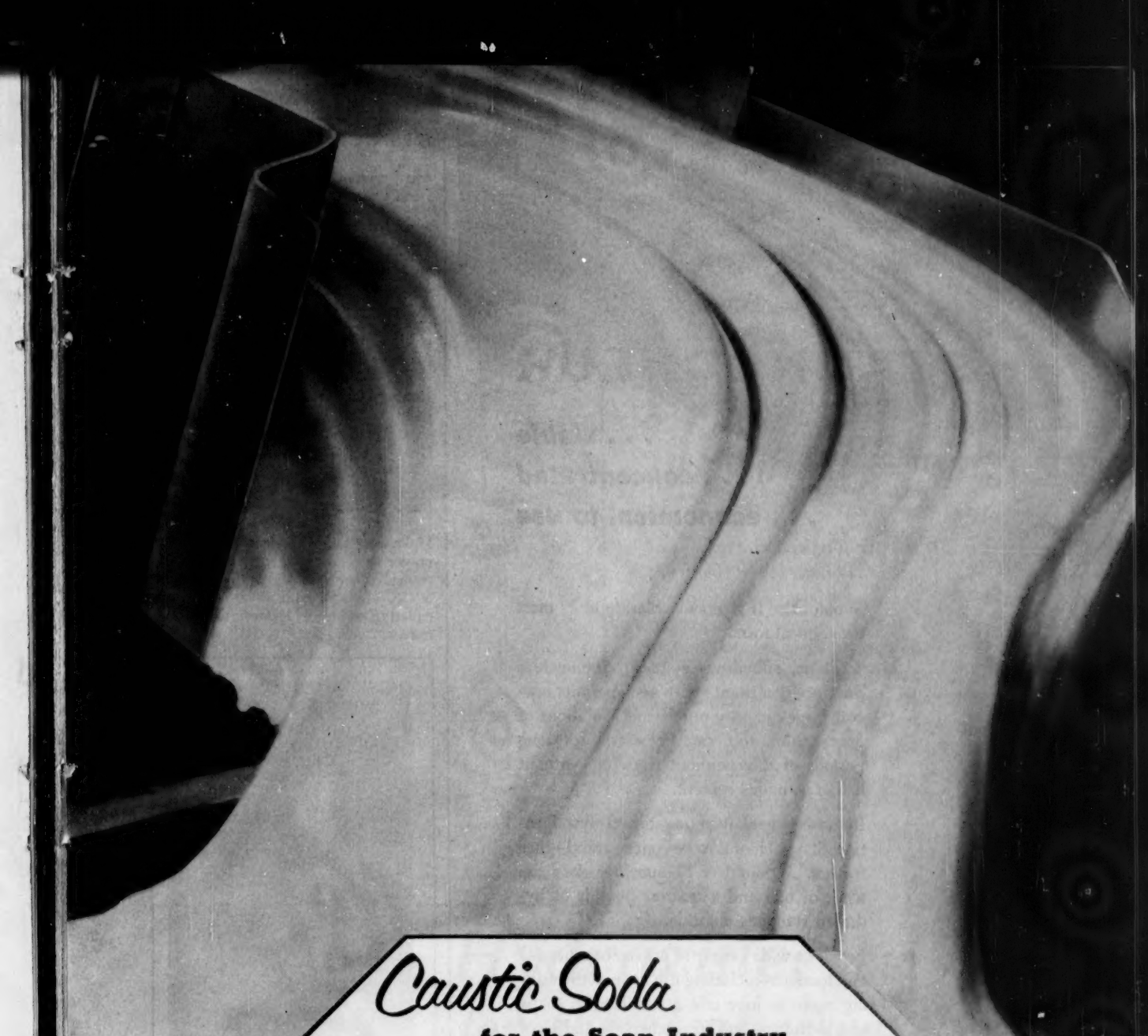
Tall One: Colgate-Palmolive Co. has begun Eastern distribution of a new giant pack of its Ajax cleanser. Like B. T. Babbitt's Bab-O, recently introduced in the large can in the Midwest, the new size holds about a pound and a quarter.

•

Deburring: Nylaslugs is the tradename for a new molded nylon tumbling media for deburring and polishing fragile parts of plastic or metal. Rampe Mfg. Co. (Cleveland) makes the pellets, which are used with an abrasive in a tumbling mill for deburring, or with polishing cream for polishing. Various sizes of the Nylaslugs are available.

•

Fast Finish: C. A. Woolsey Paint & Color Co. Inc. (New York) is now selling a new, high-luster coating for boats. The finish, for sale only to boatmakers, is said to set in 45 minutes,



Caustic Soda

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A stable, anhydrous material, Stannochlor does not deteriorate with age—permits low-cost large-quantity purchasing. Solutions of Stannochlor, too, can be stored for long periods of time without clouding—without loss of stannous content.

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Besides a wide variety of proven commercial applications—including use as an anti-sludging agent in lube oils, a stabilizer in soaps and perfumes, and for immersion and electrotinning—Stannochlor is a powerful reducing agent.

Write for data on Stannochlor and ask for information on other tin and antimony chemicals.

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SPECIALTIES. . . . .

can be recoated in 7-9 hours. It's for fresh water bottoms.

•

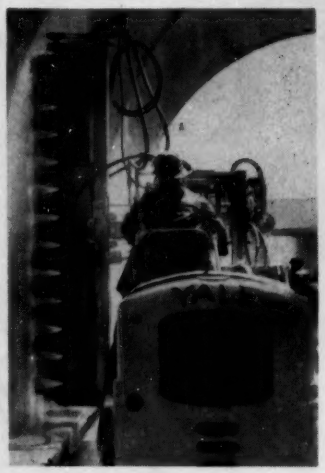
Solvent Pair: Chemical Solvents Co. (Kansas City, Mo.) is selling two solvents designed for chemical specialty formulation. BR120 is a petroleum solvent said to be odorless, and is suggested for household products (insecticide sprays, etc.); BR160 is designed for floor oils, dust applicators, etc.

•

Nonsag: Raybo 94, a new additive for paints, printing inks, and allied products has been introduced by Raybo Chemical Co. (Huntington, W. Va.). It's to stop sagging, retard settling, improve dispersion of components of these products.

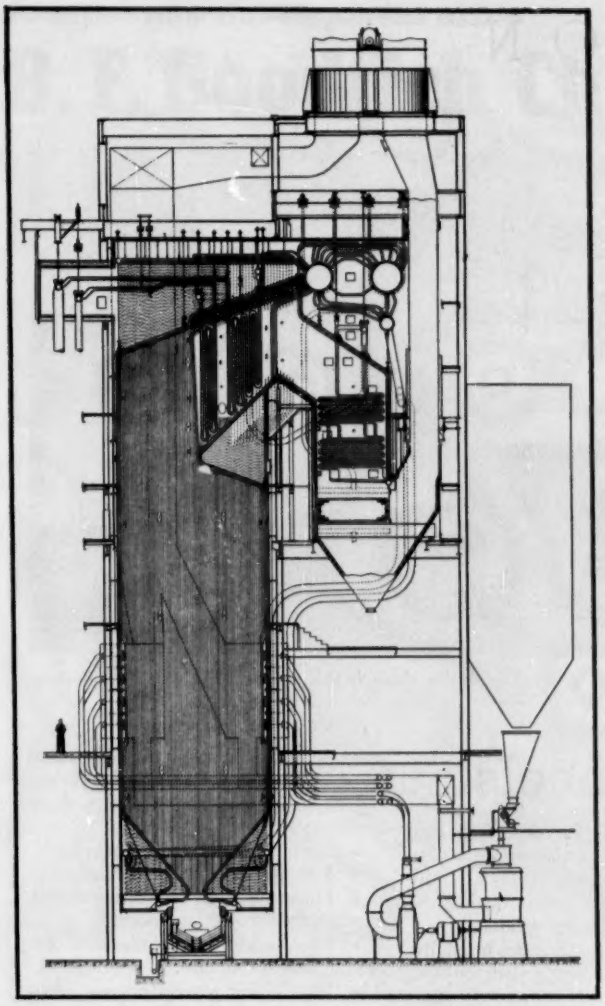
•

Make-up Stain Remover: A stain remover to remove all sorts of cosmetic stains has been worked out by D. Blum & Co. (Long Island City, N.Y.). It's called Everblum Cosmetic Stain Remover.



Mechanized Mop

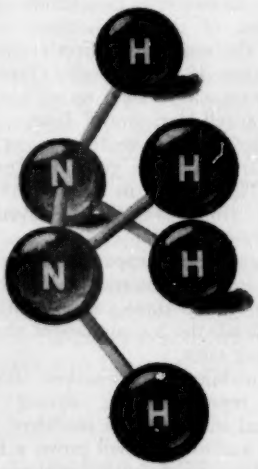
COMPLETE with detergent and water tanks, a special Yale fork truck has been adapted for tunnel wall and truck body washing by SystemsLift Truck Service (Oakland, Calif.). The mechanized mop has two sets of nozzles ahead of the hydraulically operated brushes; first set sprays on water from 250-gal. tank carried in front of the driver, second set applies detergent from 30-gal. tank behind seat. Scrub brushes are followed by a rinse-spray. Unit has reduced wall cleaning time of San Francisco's Broadway Tunnel from 128 man hours to 4.



from Hydrazine, *greater protection for boiler systems*

In power stations and industrial steam plants, the use of hydrazine to control oxygen corrosion is now well established. Published reports of experience in this country as well as abroad indicate the efficiency of hydrazine treatment to: (1) remove trace oxygen from feed water, (2) safeguard superheater tubes in steam generating plants before they go into operation, (3) protect idle boilers. In boiler water, hydrazine reacts rapidly with residual oxygen to eliminate all traces of this dissolved corrosive gas.

from Hydrazine, *new fields for chemical research*



Through greatly diversified research, more and more new applications of hydrazine are being discovered. In addition to its use as an oxygen scavenger in boiler feed water, hydrazine is an important component of plant growth regulators, and the basis of a new series of non-corrosive soldering fluxes. As a chemical capable of reacting with a wide variety of both organic and inorganic materials, hydrazine is the starting point for countless hydronitrogen compounds. Perhaps you could use the latest information on hydrazine and its many derivatives and how they might apply to your field of interest . . . if so, why not write today?

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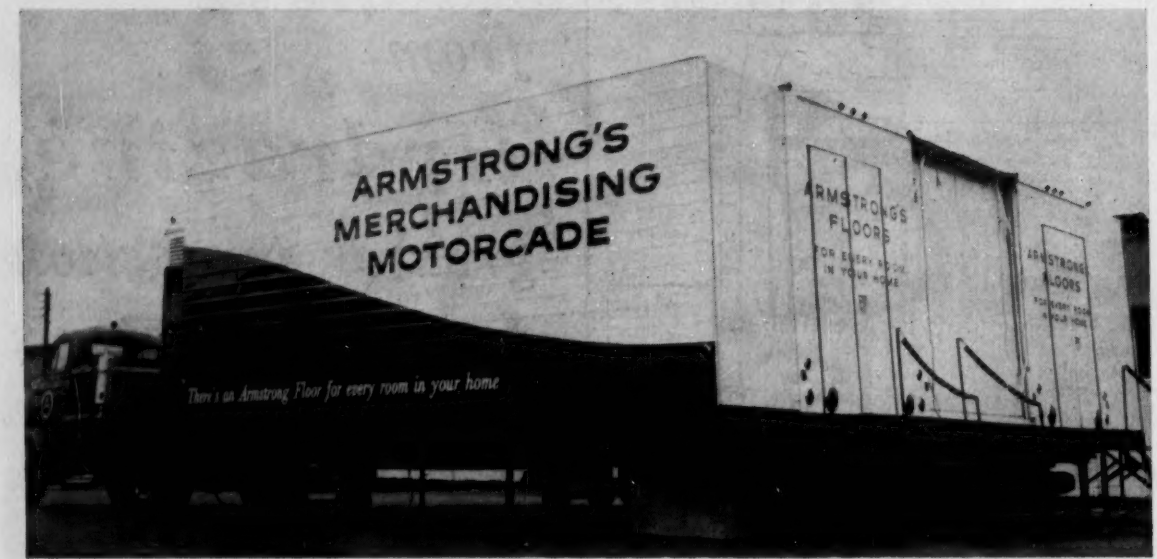


MOBILIZED CLASSROOM: Armstrong's solution to educating a gangling dealer chain is this rolling, telescoping auditorium.

Dealer School on Wheels

"If you can't send the dealer to school, send the school to the dealer." Chemical companies groaning under staggering expenses arising from shipping dealers to company schools or those faced with providing a large public-education program may well tarry and consider such a philosophy.

Now barreling down the nation's highways is one fresh example of this approach: Armstrong Cork Co.'s new mobile auditorium for dealer education. And, according to company officials, its far cheaper, practical, and more efficient than toting dealers to central or regional sales schools.

Bringing sales education to some 20,000 of the company's distributors, the portable school is completely contained in two large tractor-trailers. Upon parking the trailers side-by-side, the walls telescope out to form a 1,000-sq.-ft. meeting hall. Fabricated by the Boyertown Auto Body Works, the traveling classroom boasts these features:

- Plush seating for 100 people.
- A stage and speaker's stand.
- Three movie screens and a sound-conditioned projection room.
- Air-conditioning equipment enabling year-round use.
- Two 25 kw. generators providing a self-contained power supply.

Two instructors and two projectionists complement the mechanical equipment of the rolling lecture hall. At each of the stops planned for the 144 cities on the eight-month, 25,000-mile itinerary, Armstrong dealers receive a three-hour course in merchandising.

Object of the instruction: to increase the marketing effectiveness of its outlets from a general business standpoint rather than on a "here-is-how-you-sell-Mrs. Smith" basis.

Dealer response to the project, reports Armstrong, is generally "excellent." The turnout in some areas has ranged from "varied" to overflow capacity crowds.

Armstrong isn't expecting overnight results from its motorized sales school. But, in two to three years, estimated one official, the lessons taught should be hiking sales.

Meanwhile, trailer-maker Boyertown representatives, eyeing the chemical industry, are confident that rolling auditoriums will prove a boon to a host of training-cost-conscious companies.

BY THE HUNDRED: Dealers are sales-briefed in air-conditioned comfort.

Another new development using

B. F. Goodrich Chemical *raw materials*

B. F. Goodrich Chemical Company does not make this rigid vinyl pipe. We supply the Geon resin only.

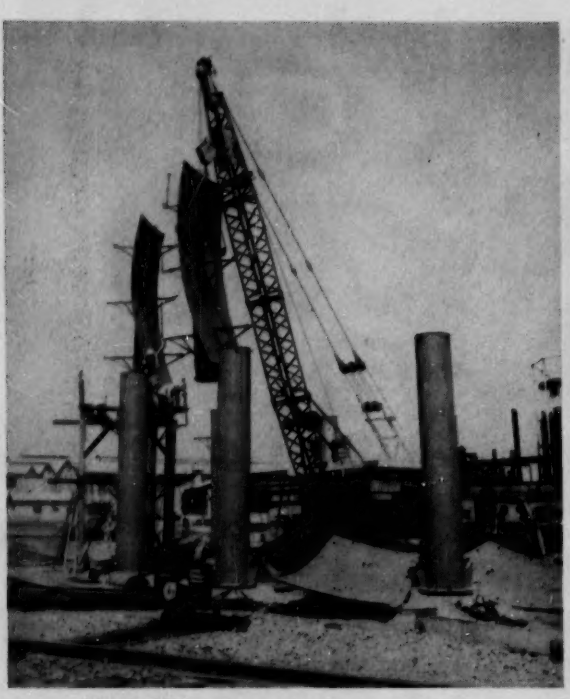
Right in the groove - rigid vinyl pipe

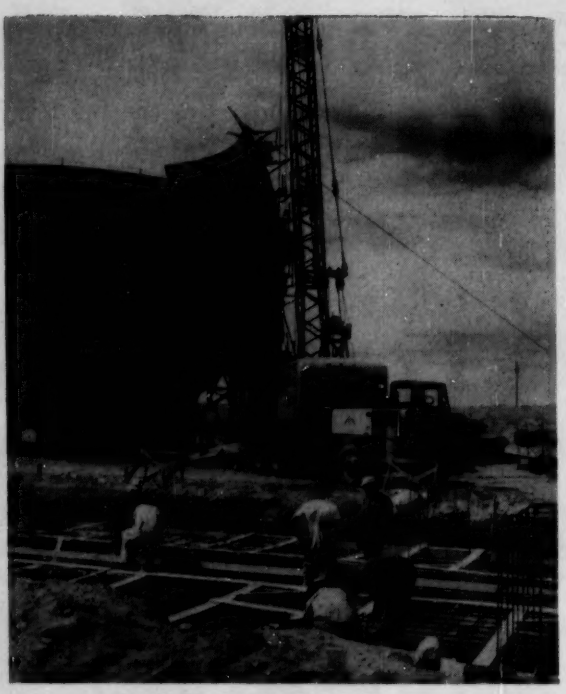
THIS is a part of a 3-mile installation of rigid vinyl plastic pipe in the oil fields of Ellis County, Kansas. It carries hot salt water—a corrosive by-product of crude oil—from a separating tank to a deep disposal well.

Oil company engineers chose *high-impact* rigid vinyl pipe made from Geon resin because it won't corrode, can stand roughest handling and has better chemical resistance. Another advantage: Money is saved in ditching operations for other pipe made of brittle materials must be cradled in a more costly graded ditch to avoid damage.

This high-impact rigid vinyl pipe has so many advantages that it may suggest a use to you or may give you an idea for an equally successful product. There are scores of other uses for Geon materials—from rigid sheets and panels to flexible colorful upholstery, wire insulation, durable flooring, sponge and many more. For information on Geon materials, please write Dept E-9. B.F.Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

GEON RESINS • GOOD-RITE PLASTICIZERS . . . the ideal team to make products easier, better and more saleable
GEON polyvinyl materials • HYCAR American rubber • GOOD-RITE chemicals and plasticizers • HARMON colors





TWO SIGNS: At Pasco (left) and Pittsburg, giant storage spheres are rising, links in Shell's new Northwest . . .

Ammonia Distribution Gear-up

When a major company, after a lengthy period of stepping up production, focuses its attention upon more efficient ways of distribution, it may be a sign.

And out on the West Coast, sign or not, Shell Chemical, top Coast ammonia maker, is busily setting up and streamlining an extensive organization to move its output from Pittsburg, Calif. (*see map, p. 50*). Much of the giant 109,500 tons/year Pittsburg plant ammonia is destined for agricultural distributors and industrial consumers in the Pacific Northwest.

Some of the more tangible signs of Shell's gear-up for the ammonia push:

- At Pittsburg: an 1,800-ton storage sphere, marine dock, compressors and compressor house, and 6,000 ft. of 8-in. pipe (plus 4-in. return for vaporized ammonia) are under way.
- At Shell's Wilbridge terminal in Portland: a 2,700-ton storage sphere, railroad scales and loading facilities, compressors and compressor house are being erected. Foundations for scales and loading facilities were laid last week.
- At Pasco, Wash.: two 2,700-ton storage spheres, compressors and compressor house, railroad scales and loading facilities are under way, ground for which was broken last week.
- Key link in this distribution chain: a specially designed ocean-going barge, 252 ft. long with a capacity of 1,680 tons. Now under construction in a Gulf Coast shipyard, it's claimed to be the first such barge ever built to carry anhydrous ammonia.

Construction of all three terminals is slated to be completed by mid-October. The ocean-going barge is scheduled to make its maiden 900-mile run in early December. Total cost of all new facilities, including the barges has been estimated by the company at $2.75 million.

Plan: When the new Shell setup swings into action, it will operate like this:

Anhydrous ammonia from the Pittsburg plant will travel by the ocean-going barge (owned and operated by Tidewater Terminals under contract to Shell) to Shell's Wilbridge (Portland) terminal. There, part of the cargo will be stored, part transshipped by river barge (also owned and operated by Tidewater) to Pasco.

From both Portland and Pasco terminals, railroad tank cars will carry the material to Oregon, Washington and Idaho markets. The rails will also be continued from Pittsburg and Ventura to the extent needed for supplementing barge movement, particularly during peak demand periods.

Full Circle? Obviously, Shell has good reason to step up its distribution service at this time. Although ammonia demand from the nitrogen-hungry wheat farmers in Oregon, Washington and surrounding areas is bound to increase, the supply-demand pattern could change rapidly. With new suppliers coming in, the supply-demand balance may well be coming full-circle to the pre-World War II condition.

Until the rapid growth of the wheat areas depleted the naturally high levels of nitrogen, potash and phosphate in Northwest soils during World War II, the fertilizer market in that area was rather skimpy. For example, Canada's Consolidated Mining & Smelting (Cominco) was forced to ship its solids from its Trail, B.C., plant to California (absorbing the freight) because of the slow development of Northwest consumption.

However, Shell has been pioneering development of the ammonia market among the wheat growers ever since the late '40s. And more recently, additional fillip from the 1.2-million-acre Columbia Basin project has boosted the fertilizer demand potential.

Centering around water from Grand Coulee Dam, all the area west

Cyanamid's

No. 6 of a series of advertisements

ACRYLO-NEWS

AERO* Acrylonitrile, a highly stable bi-functional chemical, is finding increasing use as a reactive intermediate. Its versatility is indicated by its use in the preparation of pharmaceuticals, insecticides, surface active agents, and many other useful products as well as by direct application in the broad fields of rubber, plastics and textiles. Its polymers and copolymers can be formulated to add many desirable properties to today's products and to create interesting new products for the future. The following items and abstracts, gathered from many sources, indicate a few facets of current research with this versatile chemical.

☆ ☆ ☆ ☆ ☆ ☆

ACRYLIC ACID, IMPORTANT ACRYLONITRILE DERIVATIVE, forms a thermoplastic, fusible, solvent-soluble resin when copolymerized with styrene and vinyl pyridine. Further heating with a polyepoxide yields a thermosetting, infusible, solvent-insoluble polymer ideal for protective coatings. The cured film has excellent impact flexibility, durability, and water, solvent and grease resistance.

QUICK SEALING OF POLYETHYLENE PACKAGES has been achieved with acrylonitrile rubbers in adhesive compositions. Bonding is accomplished without the usual evidence of stringiness formed with each stroke of the applicator.

AN EFFECTIVE TEXTILE PRINTING COMPOSITION of acrylonitrile-vinylidene chloride copolymer dispersed in solutions of thermosetting resins overcomes crocking which has plagued textile printers heretofore. The resins serve as excellent pigment binders when applied to fabrics as a continuous film.

"SHORTSTOP" AGENTS consisting of sulfur and sulfur donors or dithiocarbonic acid have been used to terminate polymerization of acrylonitrile rubbers and resins. During latex stripping operations, terminating the polymer chain of synthetic rubber prevents the formation of an insoluble gel while in the case of synthetic resins, the yield is characterized by uniform molecular weight material which is homogeneous and has excellent physical properties.

ACRYLAMIDE, A *Cyanamid* ACRYLONITRILE DERIVATIVE, possesses interesting adhesive properties when polymerized or copolymerized. It has been reported that acrylamide-formaldehyde products may be used as bonding agents in the manufacture of brake bodies, clutch and abrasive discs.

(Some or all of the above items are covered by U.S. or foreign patents)

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Should you wish a more complete bibliography of current literature and new developments concerning acrylonitrile, we shall be glad to place your name on our mailing list.

As the pioneer producer of this exciting vinyl monomer, American Cyanamid has expanded its production facilities to assure users adequate supplies at low price. Write for technical assistance in your acrylonitrile research.

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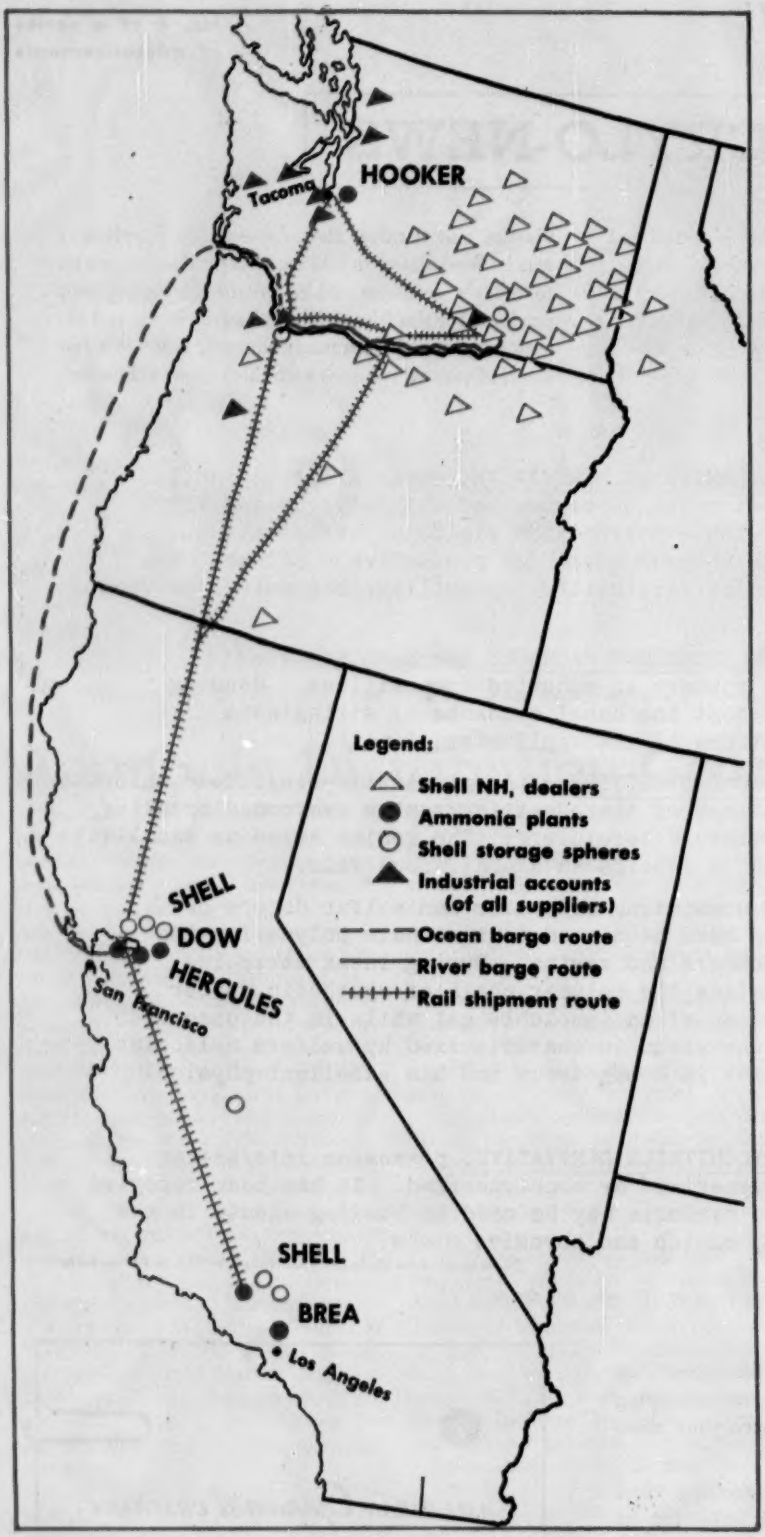
Story begins on p. 48



AMMONIA CHAIN: More output, new facilities, a selling network strengthen Shell's hand.

of the line between Grand Coulee and Pasco should be in cultivation by 1960.

All this adds up to a rising nitrogen demand. Latest U.S. Dept of Agriculture estimates for Oregon and Washington posts current demand at 50,000 tons (nitrogen content), projected 1956-57 demand at 92,000 tons.

Translated into terms of anhydrous ammonia, this means a possible increase by 1957 of 50,000 tons for agricultural ammonia alone. And although no corresponding figure for industrial demand is readily available, one informed "guesstimate" of increased ammonia demand from industry is 5% a year.

Satisfied? Amidst this lively and growing market, however, a scramble seems to be shaping up. In California, alone, ammonia capacity now hovers about the 300,000-ton/year mark, breaking down about like this:

Company	Location	Tons/year
Dow	Pittsburg	8,000
Hercules	Pinole	50,000
Brea	Brea	86,000
Shell	Pittsburg	109,500
Shell	Ventura	65,000

In addition other ammonia and competing-material suppliers to be reckoned are:

- Hooker, at Tacoma, with capacity recently augmented to 22,000 tons/year.
- Cominco, at Trail, B.C., long a substantial fertilizer chemical supplier, now planning to enlarge its operations with a multimillion-dollar urea unit.
- Wilson & George Meyer, longtime importers, currently arranging to bring in more Norwegian nitrate and urea.

More to Come: Adding to the scramble are certain other factors, sure to be felt within the next year or two. Some of these:

- Brea's expansion, by early 1955, of an additional 26,000 tons/year of ammonia.
- Columbia River Chemical's planned-for 53,500-ton ammonia unit at Pasco, due onstream late next year.
- Utah Chemical's projected 100,000 ton/year plant at Mt. Pleasant, tentatively due in late 1955.
- Salt Lake Chemical's 45,000-ton unit at Salt Lake City, a possible reality by the end of next year.

The Utah plants are important in the over-all picture since they will probably turn to the Northwest to market at least a portion of their output.

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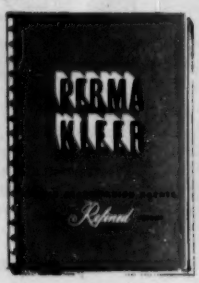

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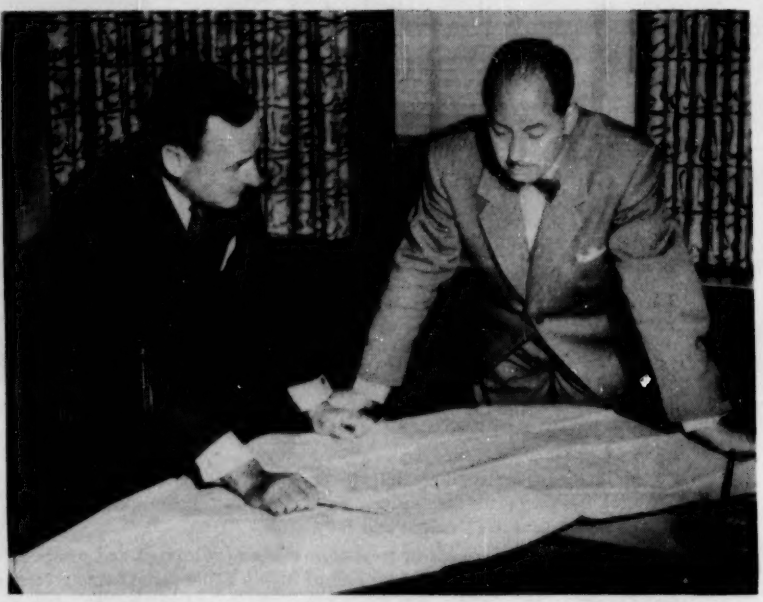

BARGE HUDDLE: Operations Mgr. L. M. Roberts (left) discusses blueprint of ocean-going ammonia vessel with Sales Mgr. V. C. Irvine.

Furthermore, Western companies are not the only eyers of the still-lush Pacific Northwest market. As a straw in the competitive wind: about June 1, Phillips let it be known it would absorb up to $10/ton of the freight cost on anhydrous ammonia shipped to the West Coast from its Etter, Tex., plant.

And currently, trade estimates have it that about 70 tank cars/month of ammonia are moving into the West from more easterly producers. Future significance: some non-Western suppliers are likely exploring how best to cut a slice of the Northwest pie.

Still other Canadian interests are planning to push more nitrogen across the border. Two likely contenders:

- New British Dominion Oil, known to be deeply interested in constructing an ammonia unit in Southern Alberta.
- Sherritt-Gordon Mines, currently moving the greater portion of its 75 tons/day ammonia output into Minnesota, seriously considering doubling its capacity at Fort Saskatchewan, Alta., to make a bid for Northwest trade.

Full Steam Ahead: What it all adds up to is just this: although the Pacific Northwest nitrogen demand has by no means reached its peak, the rash of new producers plus heightened interest in the area on the part of old suppliers will more than likely step up competition.

And Shell, not one to stand idly by while its carefully nurtured market is invaded, is spreading a network of distributors over the area.

Already, Shell Chemical's two distributors (one in Yakima, Wash., the other in Athena, Ore.) have more than 40 outlets serving the region. And even before its Northwest pipelines are filled, Shell plans to expand greatly its ammonia dealerships and marketing area (*see map*).

The Shell pipeline will start filling up late this summer, at which time the California and Arizona agricultural demand seasonally slacks off. Heavy tank-car shipments are scheduled to move from Pittsburg beginning in October right up until the big barge takes over in December.

If, as seems likely, the Northwest ammonia market is entering a new phase, Shell is preparing for what may come. Claim Shell's marketers: "This system should enable us to serve efficiently the agricultural ammonia market in the Northwest during the highly competitive days ahead."

•

For your reference file: Du Pont's Explosives Department, Wilmington, Del., has issued four new technical bulletins: Nitrocyclohexane; Ethylene bis(Glycolic Acid); Isocinchomeronic Acid; and Pyromellitic Acid. Physical data and suggested uses are outlined in the booklets.

- Essential Oils, Aromatic Chemicals, and Certified Colors—price catalog, Dodge and Olcott, Inc., New York, N. Y.

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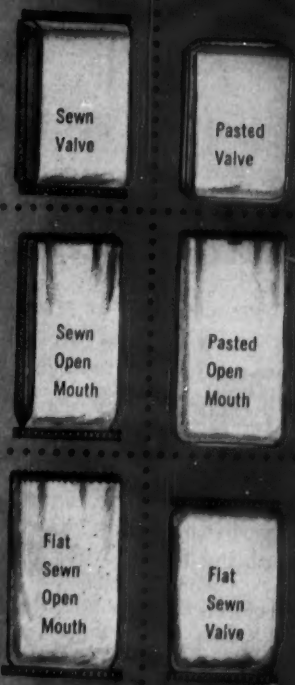

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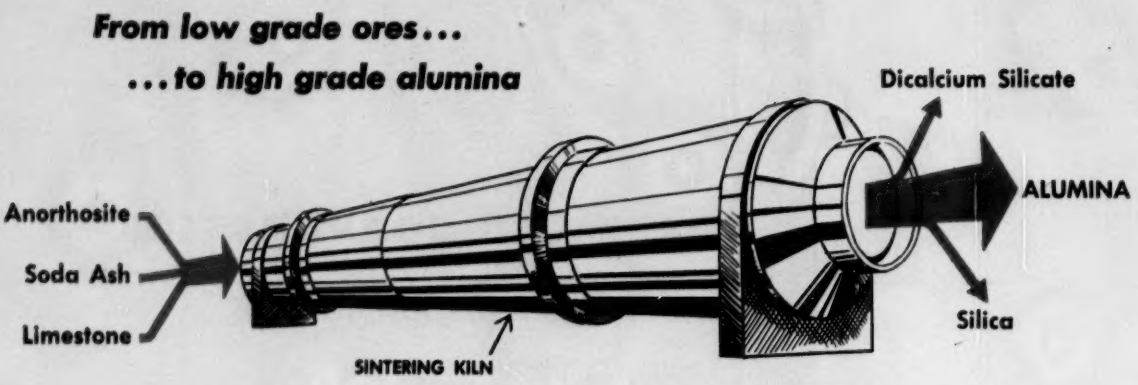
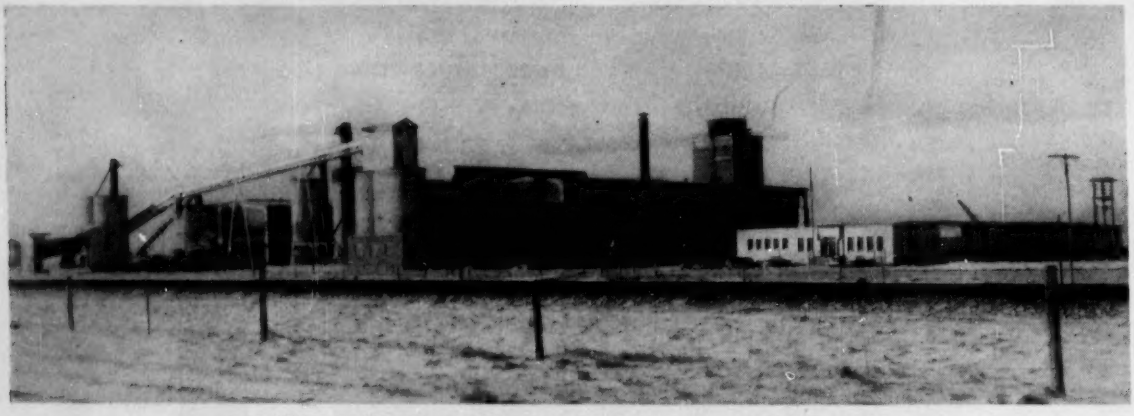


LIME-SODA-SINTER PROCESS: A soluble sinter is the goal.



LARAMIE ALUMINA WORKS: In a bleak setting, a promising operation.

Making Sure of a Source

The Bureau of Mines is currently checking operational data on a new process for winning metallurgical-grade alumina from low-grade silicate ores.

Evaluation of results is expected to show industry that the lime-soda-sinter process works well, but can be economically feasible only if U.S. is cut off from imported bauxite.

However, it might well be the commercial alumina operation of the future, has already supplied commercial know-how enabling firms to use lower-grade ores.

At this moment, the Bureau of Mines is sifting data, evaluating operational reports and drafting a soon-to-be-ready appraisal of its experimental alumina plant at Laramie (Wyo.), shut down just recently. Last year (*CW Newsletter, June 13, '53*), the bureau started test operations to determine whether or not alumina could be produced at reasonable cost from anorthosite, a commercially unworkable aluminum silicate that abounds in the nearby Laramie mountains. The probable conclusion: presently, the operation is economically infeasible; it would be used only when price is no longer a controlling factor.

The Laramie undertaking is one of the bureau's major projects in a program to develop industrial processes for producing aluminum from domestic raw materials. The aim is to make the United States independent of imported bauxite, the usual source of aluminum. A full-scale war, for example, could quickly overrule price as a controlling factor. And more immediately pertinent to processing engineers, a number of process improvements uncovered by the bureau can be applied to going aluminum operations.

Soluble Sinter: Such conventional methods as the Bayer caustic soda extraction could not be used at Laramie for the production of metallurgical-grade alumina; the large amount (50%) of silica in the low-grade anorthosite ore would combine with the caustic soda to form insoluble sodium-aluminum silicate, cause high losses of alumina and soda.

The operation that was set up at Laramie last year was based on a continuous lime-soda-sinter process wherein water-soluble sodium aluminate and water-insoluble calcium silicate are formed by sintering the proper proportions of anorthosite, limestone and soda ash.*

* Anorthosite contains limestone and soda ash, but make-up of both is required.

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Actual operations, of course, are complex, involve a number of distinct processing steps. Anorthosite, trucked 16 miles from the Laramie range where it is surface-mined, is first crushed, sent to storage silos. Limestone, also available in nearby Laramie, is similarly crushed and stored, while the requisite soda ash is brought up from Westvaco's Green River (Wyo.) works in car lots.

From storage, anorthosite and limestone are fed in weighed amounts to a wet ball mill, where soda solution is added. The resulting mud is passed through a dryer (500-600 C) into a sintering kiln which heats the charge to incipient fusion (1,100-1,200 C). The sinter is then crushed, sized, and sent to surge bins.

The crushed sinter from the surge bin passes into another wet ball mill where the sodium aluminate is dissolved out of the sinter by additional soda solution; the insoluble residue (principally dicalcium silicate with some traces of iron, titanium, alumina and soda) is concentrated by Dorr thickeners. After filtration, the sodium aluminate solution is fed together with burnt lime into an autoclave; the residual silica precipitates, is filtered off along with the lime, and the aluminate solution passes on to a carbonator.

Carbon dioxide, bubbled through the desilicated solution, precipitates alumina as the trihydrate, controls particle size of the precipitate. The trihydrate is sent to a calcining kiln (1,200 C), forms anhydrous aluminum oxide which can be used as cell feed in the production of high-grade aluminum metal. End process liquors are treated for the removal of impurities such as potassium sulfate and for economically essential soda ash recovery.

Balance Sheet: Actual yields varied as a result of continual experimentation, at times reached 85% recovery of alumina. According to the Bureau of Mines, the high yields could be maintained if desired, are comparable to recoveries obtained in current commercial operations. Since present refiners start with a higher percentage alumina ore, however, yield from the lime-soda-sinter process is much lower per ton of raw ore; and the greater capital investment needed for the sintering steps raises the cost differential even higher.

Too, the Laramie operation depends economically upon the ready availability of limestone and soda ash. If other potential alumina ores, like the Wyoming anorthosite, contain soda ash, only the initial soda requirements are of concern since the soda ash loss seldom exceeds the amount present in the ore. And while high percentages of limestone are present in many alumina ores, the large quantity required (to precipitate the silicate) necessitates an additional calcium oxide source.

One possibility to help redress the economic handicap of the lime-soda-sinter process: use of the extracted residue as a cement raw material.

Operational Denouement: One of four experimental alumina plants* built by the Defense Dept. during World War II, the Laramie works was tied up by litigation, not sold as were the other three. But it has been up for sale since the Bureau of Mines returned it to General Services Administration on June 30. Total experimental output during the bureau's brief tenure was insignificant, barely reached 800 tons; but the experiments, avers the bureau, have provided other more fruitful benefits.

Of greatest commercial significance, perhaps, is the application of experimental results to going operations.

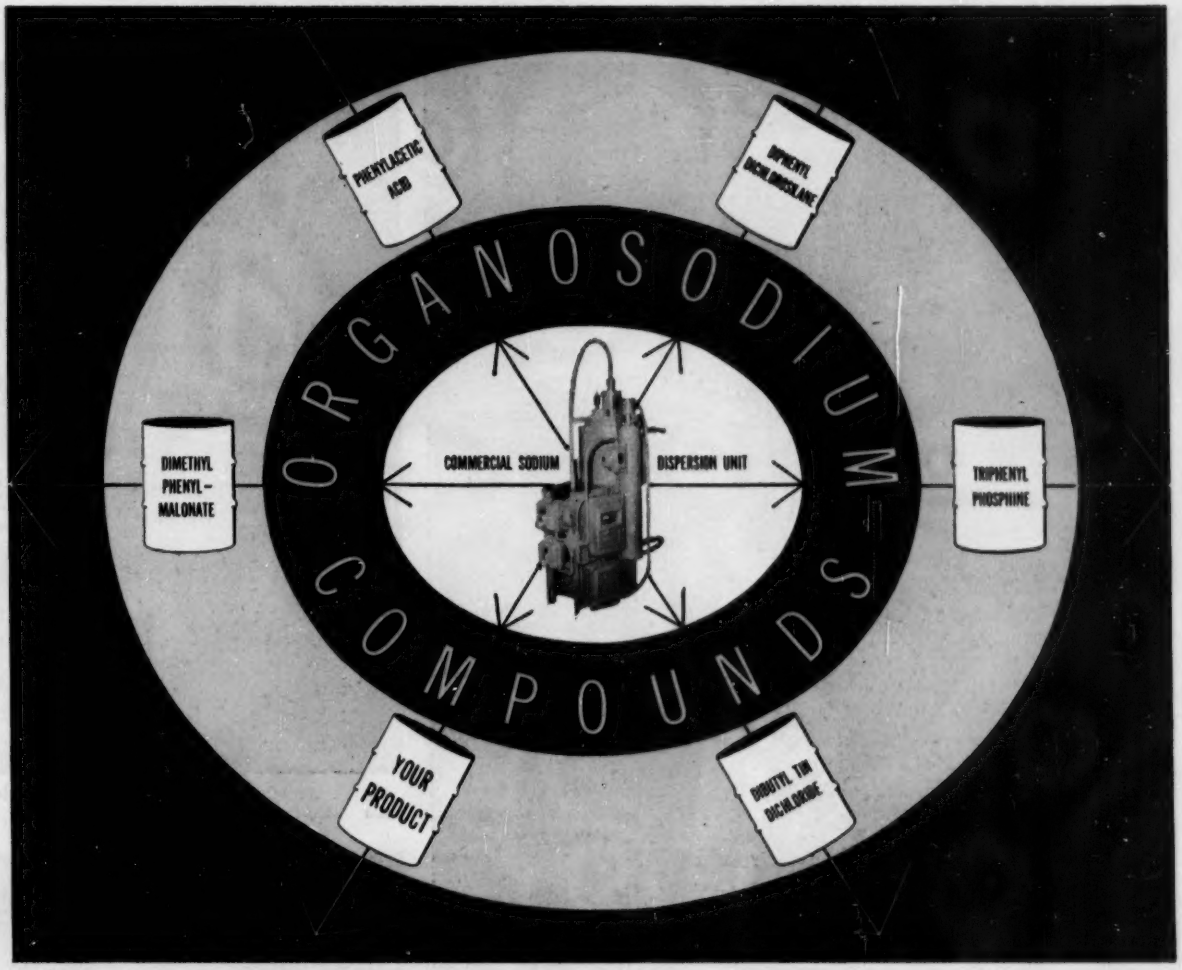
Many industry observers, invited by the government, came to watch and learn. For varying periods over the past year, representatives were sent by Reynolds, Kaiser, Anaconda, Harvey, and Olin among others. As a result, raw ores containing more than 7% silica are no longer considered commercially unsuitable; one Arkansas operation has even gone to 15% silica-containing material.†

According to a bureau spokesman, all the aluminum companies are interested in this type of research, "for materials similar to this [i.e., high-silica ores] will be the eventual source of alumina." It wouldn't surprise him, he continues, to see companies go to 20% silica ores shortly, and later, to raw materials containing silica and alumina in a 1:1 ratio. Of course, the higher the silica content, the larger is the sintering unit required and the greater the capital cost.

But the most nutritious fruit of the Laramie investigations is the knowledge that the process will work on low-grade alumina silicates, that—should it become necessary—the U.S. could substitute domestic ores (extensive anorthosite deposits reach from Wyoming into Colorado, crop out in New York, Vermont, Maine and Labrador) for imported bauxite.

* The war ended before they were ready to be put in operation.

† In this setup, the company added a sintering unit just large enough to handle the 15% silica. The ore is treated in a conventional manner; as an additional step at the end, the insoluble sodium-aluminum silicate is sintered, dissolved, and the alumina recovered.



Organosodium Compounds (R-Na) Open New Frontiers

Microscopic sodium particles dispersed in inert hydrocarbon media now make practical the production on a commercial scale of organosodium compounds such as phenylsodium and benzylsodium. These compounds are characterized by a direct carbon to sodium bond and are obtained by:

1) Replacement of a halogen
$$RCl + 2Na \longrightarrow RNa + NaCl$$
2) Substitution for an active hydrogen (metalation)
$$RCH_3 + R'Na \longrightarrow RCH_2Na + R'H$$
$$2RH + 2Na \text{ (Dispersion)} \longrightarrow RNa + H_2 \uparrow$$
(sometimes possible)
3) Addition to an activated double bond
$$R_2C = CR_2 + 2Na \longrightarrow R_2C(Na) - CR_2(Na)$$

As is illustrated above, organosodium compounds, such as phenylsodium, are useful tools in three types of syntheses:

a) addition reactions
$$RNa + R_2C = O \longrightarrow R_3CONa$$
b) metalation reactions
$$RNa + R'H \longrightarrow R'Na + RH$$
c) Wurtz type reactions
$$RNa + R'Cl \longrightarrow R'R + NaCl$$

Technical literature contains numerous references to organosodium compounds as reaction tools, but only now are commercial applications possible through the development of sodium dispersions. Also, these dispersions may often be substituted in reactions where the literature references use alkoxides, sodamide, sodium hydride, potassium or lithium — and sodium is available in large scale quantities.

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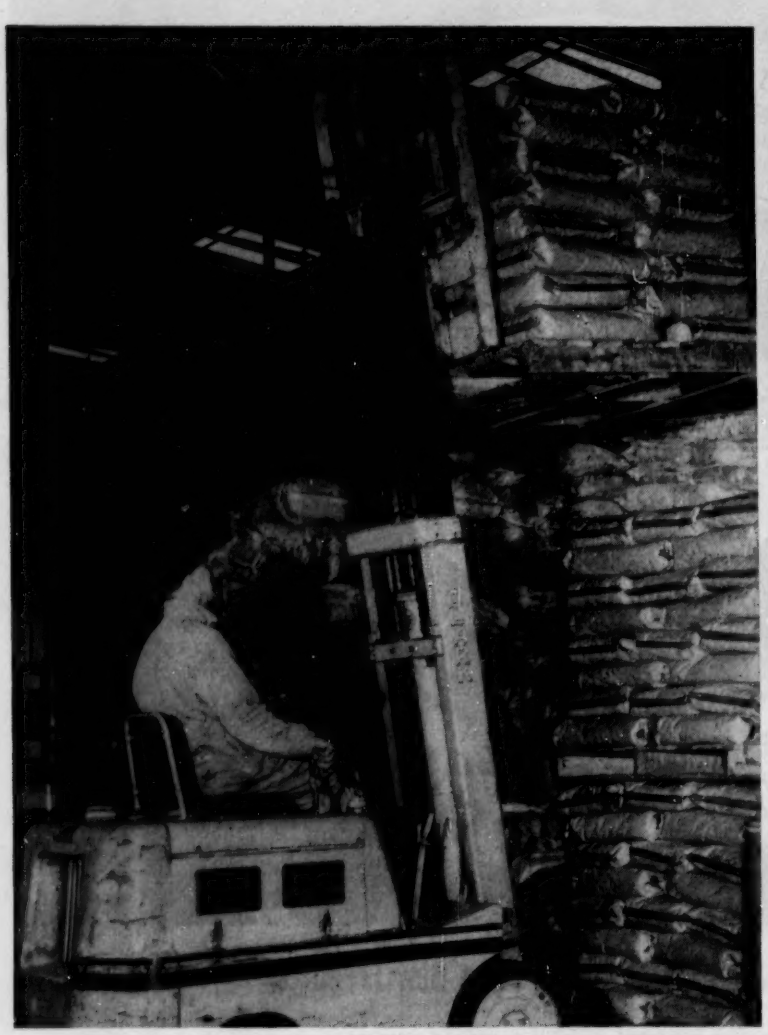


1 BAGS ARE PALLETIZED, then transferred to a fork truck . . .

Fork Trucks Provide the Lift

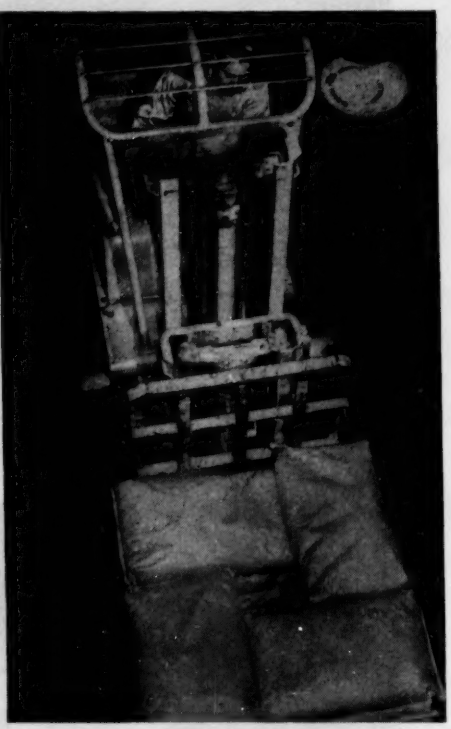
Fork trucks have long since proved they're as handy around a chemical plant as safety pins around the house. But firms are still finding new uses for them. Take the case, pictured on these pages, of W. H. & L. D. Betz, Philadelphia's water treatment firm.

For many years, Betz had a 2,000-lb. elevator that it used for lifting raw materials from the first floor to the second floor, where they were weighed and fed to the hoppers. Only trouble was that the elevator was located at the rear of the building, an uncomfortably long haul from both the storage area and the scale hoppers.

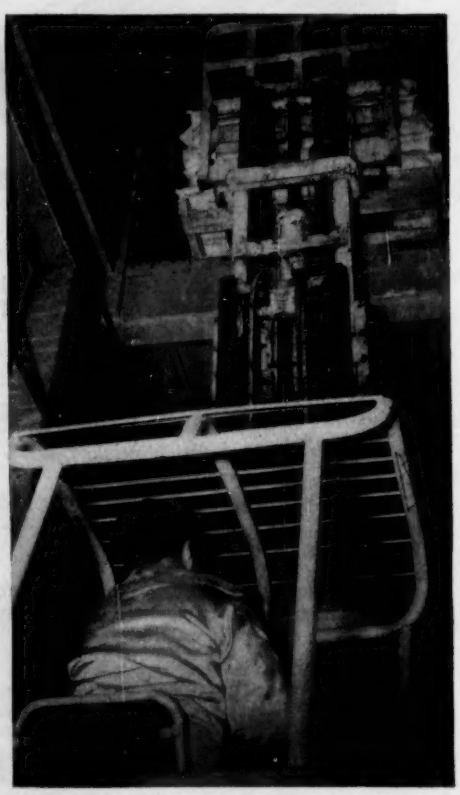
Then Factory Superintendent Andy Olsen had an idea. Why not, he asked, cut a hole in the second floor handy to both areas, then use fork trucks to lift the material? He went to Clark Equipment Co., returned with an engineered fork truck having double uprights mounted on a standard Carloader.

The seemingly simple idea has paid off handsomely for Betz. Says Olsen: "We can now elevate 50 tons of material in three hours—that's from the first-floor warehouse to the stockpile on the second floor. Under the old method with the elevator, it would take a full day and the time of three or four men to do that."

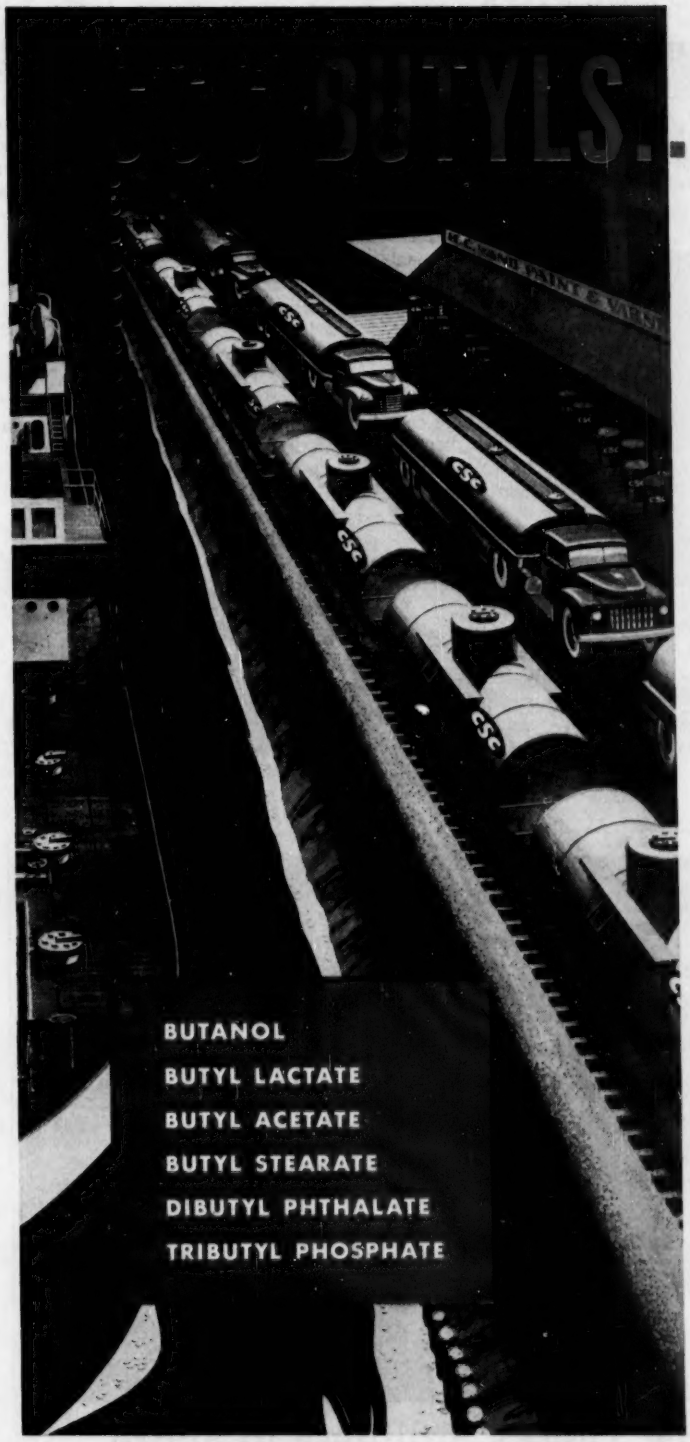
And aside from their regular duties, the high-lift trucks double as ladders for the maintenance crew. They're ideal for getting the worker to inaccessible places to do such jobs as changing bulbs, putting up pipes or washing windows.



2 . . . which carries them to spot below 6x6-ft. opening in floor. In action . . .



3 . . . as elevator, it lifts pallet 15 ft., deposits it on second floor.



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Fiber Filters: Filtrex Corp. (New York), recently formed to manufacture glass fiber filters, avers it has developed a process that makes the fibers soft and pliable, eliminates splintering. Too, the fibers are separated and arranged in graded densities in order to eliminate surface loading, allow maximum flow when heavily loaded.

•

Portable Grinder: Quality Industries, Inc. (Cleveland) has introduced an automatic, portable roll grinder, claims it will eliminate costly roll removal and reduce downtime, amperage consumption, and frequent bearing changes. Mounted on permanent brackets, the grinding unit is adjusted by turning two set screws while the complete operating cycle is automatically regulated with two-way microswitch and push-button control.

•

Ultrasonic Gauge: An automatic ultrasonic gauge that measures thickness and detects flaws has been put on the market by Branson Instruments, Inc. (Stamford, Conn.). Among typical applications for Vidigage in the processing industries are detection of lamination and hydrogen blistering, corrosion inspection on cylinders and piping, and gauging complex shapes. Readings are indicated directly on a large-size screen (which allows for scales up to 17-in. long), are based on the principle that a given material's resonating frequency varies directly with its thickness.

•

Streamlined Prospecting: Nuclear Instrument & Chemical Corp. (Chicago) has just published a brochure titled "Geological Surveys with Radioactivity Measuring Equipment." The pamphlet describes scintillation counting equipment and how it is used from ground or air level in exploration for oil or prospecting for uranium ores.

• The Radiac Co., Inc. (New York) has lightened the prospector's load by employing a printed circuit in its Model GC-238 Geiger Counter. The company claims that it is the first commercially available counter to use that type of circuit.

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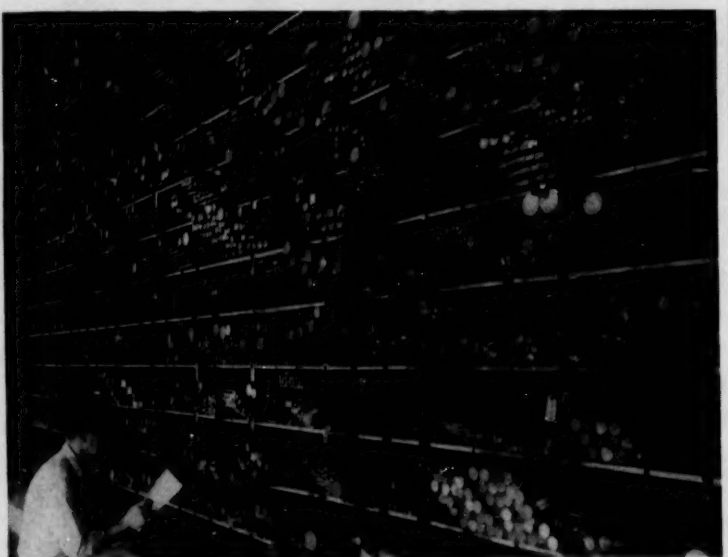
Tank Covers: Heil Process Equipment Corp. (Cleveland) is fabricating lightweight tank covers up to 18 ft. across from its Rigidon plastic. The covers, declares Heil, offer high corrosion re-



Now There's Stainless to Spare

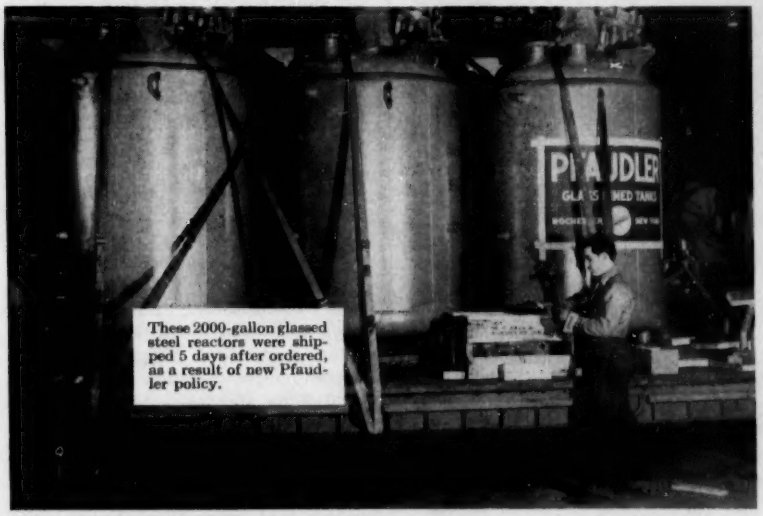
IF IT SEEMS like only yesterday that the chemical industry might have to curtail some of its expansion plans on account of the scarcity of stainless steel, that's because it virtually was. But here is pictorial evidence of the changing times: Armco Steel Corp.'s stocked supplies of special and standard shapes of stainless bars.

In sharp contrast with the situation that existed little more than a year ago, Armco now boasts of its ability to fill orders quickly.

Corrosioneering News

Quick facts about the services and equipment Pfaudler offers to help you reduce corrosion and processing cost.

Published by The Pfaudler Co., Rochester 3, N.Y.



These 2000-gallon glassed steel reactors were shipped 5 days after ordered, as a result of new Pfaudler policy.

You get a blotter . . . we'll get a packing case

New Fabrication Policy Speeds Equipment

Almost before the ink dries on their purchase order, many chemical processors have been surprised recently to learn that their new Pfaudler equipment would be delivered in a few days.

A new policy of manufacture, emphasizing standard design, makes this possible. This policy is revolutionary in the process equipment industry, and results from Pfaudler's 70 years' experience in supplying glassed steel and alloy equipment to processors. By carefully noting which features are most often required, they have incorporated many "custom" features in standard designs, thus providing maximum flexibility of equipment, with faster delivery.

You can take advantage of off-the-shelf deliveries of glassed steel or alloy reactors, columns, heat exchangers and other equipment by discussing your problem with the Pfaudler representative. Let him recommend, where possible, the *standard* Pfaudler units that incorporate the features you need.

Many of these units are in stock now, waiting to be shipped to you. Call in your Pfaudler sales engineer today and let him help you save time and money.

The Bonnet that Heads Off Corrosion!

Corrosion-proof Hastelloy and glassed steel join forces to resist severe acid attack

Handling pure monochloro acetic acid free of low-boiling acid chlorides requires a heat exchanger that shrugs off relentless corrosive action. To meet this need, New York-Ohio Chemical Co., a subsidiary of Stauffer Chemical Co., turned to Pfaudler corrosioneering.

The answer: Hastelloy "C" for the tubes, and glassed steel for the bonnets, or headers. This combination cuts down on expense as well as corrosion. By using costly Hastelloy only where absolutely necessary, and taking advantage of the less expensive corrosion resistance of glass plus the working strength of steel, substantial savings were made.

To solve problems such as this, Pfaudler corrosioneers enjoy complete freedom in selecting materials. With *every* type of alloy, from stainless steel to titanium, at their disposal they can give you exactly what your process requires. And, when practical, they can also call upon famous Pfaudler high-acid resisting glassed steel.

For an unbiased recommendation on your corrosion equipment problem, talk it over with your Pfaudler representative. Or check the corner card for further information.

How Lederle Keeps Pharmaceuticals Pure

When you've got to cram highly concentrated vitamins or drugs into a tiny pill no larger than your shirt button, you just don't have room for product contamination.

Lederle Laboratories Division of American Cyanamid puts the hex on contamination, at its Pearl River, N. Y. research and manufacturing center, with the two-fisted corrosion resistance of glass combined with the structural strength of steel.

In Pfaudler glassed steel, they found the perfect pilot plant equipment for scale-up from laboratory apparatus. Using 10 Pfaudler glassed steel reactors of various sizes, they have an economical chemical plant that licks corrosion before it starts. Product purity is safeguarded from start to finish of each process.

From pilot plant to full-scale operation, glassed steel reactors provide the corrosion resistance that assures product purity at Lederle's Pearl River plant.

If you have a problem of product contamination, you may get an easy answer by checking the corner card below and mailing it to Pfaudler.

THE PFAUDLER CO., Rochester 3, N.Y.

Please send more information on:

- ☐ Immediate delivery of glassed steel equipment
- ☐ Corrosion materials for_____process
- ☐ Glassed steel for processing_____

NAME_____

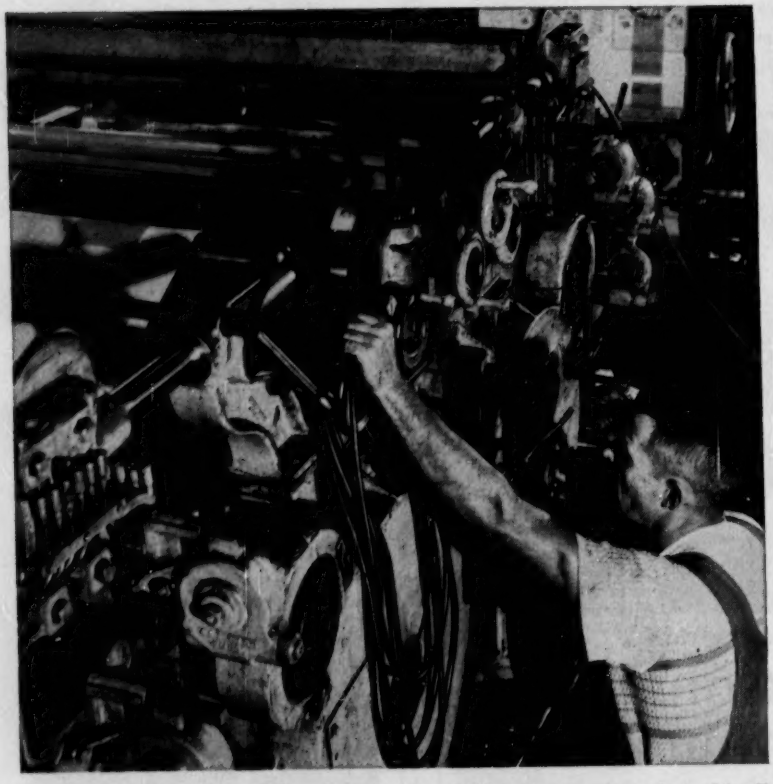
COMPANY_____

ADDRESS_____

CITY_____ ZONE____ STATE____

No. 3 of a series

How Bemis makes GOOD multiwall bags for you



As with other types of printing, there is no substitute for experience in multiwall paper bag printing. A typical Bemis pressman is Wesley Pitcher, shown here at the 4-color press he operates at the Bemis plant in Peoria. Wesley went to work in the printing department 21 years ago and has been a pressman for 18 years.

Good bag printing requires three things . . . and Bemis has 'em!

Good multiwall bag printing . . . the kind that makes your brand a star salesman . . . requires good presses, good plates and good workmen. *And Bemis has 'em!*

1. Specially designed presses . . . with features needed for *best multiwall printing* . . . are used.

2. Our own skilled, experienced plate makers make our printing plates . . . so we control quality every inch of the way.

3. Since we have been making and printing quality multiwalls for twenty-seven years, we have trained our pressmen to the point that they do, day in and day out, the best printing in the bag industry.

Bemis

BEMIS BRO. BAG COMPANY

General Offices—St. Louis 2, Mo.

Sales Offices in Principal Cities

PRODUCTION. . . .

sistance and structural strength at elevated temperatures, are pigmented in order to reduce maintenance. Special openings and outlets are furnished as required.

•

Safety Shields: For the worker who needs face and throat protection and yet doesn't want to be bothered with a permanent-type shield, E. D. Bullard Co. (San Francisco) is marketing acetate clip-on and swing-back shields. Both units are heat formed to hold their shape, easily attach to any safety hat or cap.

•

'Sardap': Putting atomic energy to work and borrowing from the field of functional terminology, Nuclear Research Corp. (Philadelphia) has come up with a spate of Small Angle Radiation Detection and Presentation (Sardap) industrial devices. All instruments have three major components in common: a radiation source whose positioning and intensity can be controlled; a high efficiency detector, which picks up the radioactive beam after it has passed through the test object; and an electronic presentation system that records any beam variation caused by the test object.

Of the group, two instruments are now ready for industrial applications: the general purpose test unit, TU-1A, which is so sensitive, says the company, that it will detect and record holes in metal as small as one-millionth of a cubic inch in volume; and the automatic liquid level test unit, TU-3A, which automatically controls liquid levels within various-shaped containers up to and including large storage tanks.

The principal difference between the two applications, asserts Nuclear, is the difference between a qualitative function and a quantitative function. In the first case, TU-1A tells the user the size (or weight) of the variation; in the second instance, TU-3A determines whether a certain material is present within a container at a specified point.

•

In Brief: Instrumentation for the modern process plant is the subject of Bailey Meter Co.'s (Cleveland) 16-page Bulletin 17. The 1954 edition offers descriptions and illustrations of equipment for measuring, transmitting, receiving, interpreting and controlling 18 process variables.

• Preparing for its 100th anniversary next year, Crane Co. (Chicago) has compiled a fact sheet crammed with information on its activities over the past 99 years, its present operation and expectations.

Spencer Service is Wonderful

"Gee, there goes another delivery they'll get yesterday!"

SPENCER

America's Growing Name in Chemicals

SPENCER PRODUCTS: "Mr. N" Ammonium Nitrate Fertilizer • SPENSOL (Spencer Nitrogen Solutions) HO-NO-MO (Spencer Herbicide) • Ammonia (Commercial and Refrigeration Grade) • Aqua Ammonia 83% Ammonium Nitrate Solution • Synthetic Methanol • Formaldehyde • Hexamine • Polyethylene (1955) FREZALL (Spencer Dry Ice) • Cylinder Ammonia.

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Works: Pittsburg, Kas., Henderson, Ky., Chicago, Ill., Vicksburg, Miss. & Orange, Texas (under construction)

To SERVE YOU PROMPTLY, Shell Chemical has established complete denaturing plants in key industrial centers.

Shell Chemical's ethyl alcohol is of the highest quality, meeting or surpassing all Federal and commercial specifications for purity. It is available as pure alcohol (190 proof), in specially and completely denatured grades, as well as in two proprietary solvents—Neosol® and Neosol A.

Next time you need ethyl alcohol, remember that Shell Chemical bulk distribution facilities are as close as your telephone . . . ready to make the fastest possible delivery . . . in drums, tank trucks, compartment trucks, tank cars or compartment tank cars.

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Your Shell Chemical representative will be glad to discuss your alcohol supply problem with you. Write or phone your nearest Shell Chemical office. Send for "Organic Chemicals," SC:53-18, a catalog of our complete line of other solvents, intermediates and resins.

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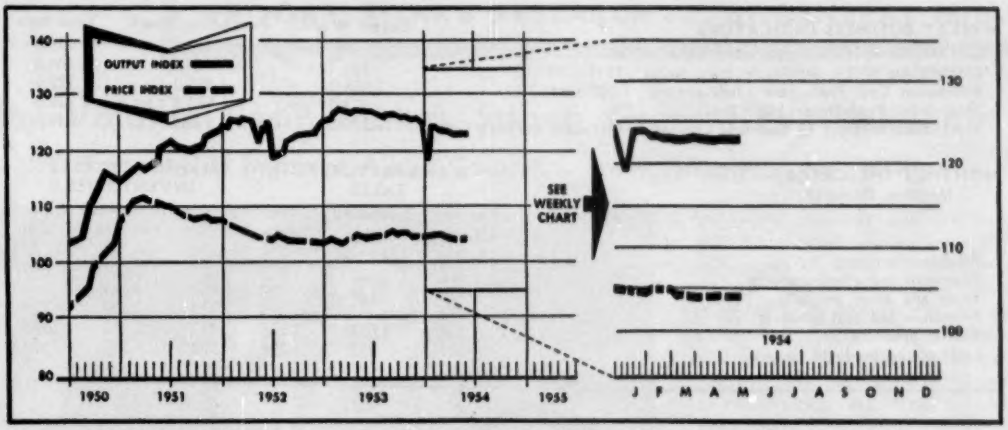
MARKETS . . . . . .



CW Index of Chemical Output—Basis: Total Man Hours Worked in Selected Chemical Industries
CW Price Index—Basis: Weekly Prices of Sixteen Selected Chemicals

MARKET LETTER

Summer vacation plant shutdowns by both producers and consumers continue to depress chemical sales. But marketers expect the second half of '54 to bring an upturn. By early fall business is expected to resume a lively clip (see Newsletter, p. 9).

•

By then, too, look for quite a bit of animation in the polyamide arena. Du Pont, long the Goliath in U.S. nylon, is slated to be beset by several Davids, who already are beginning to gather market-nicking stones.

For example, latest to enter the nylon fray is National Aniline. Already being customer field-tested is National's Caprolactam monomer, scheduled to hit commercial production levels at its spanking-new plant near Hopewell, Va., sometime in September or October. Later in the year a new, nearby spinning plant will turn out filament.

The two installations set National back about $28.5 million, can produce 20 million lbs./year of both the monomer and filament.

American Enka (Enka, N. C.) will also swing into a rated 4-million-lbs./year output of filament by autumn. Meanwhile, Industrial Rayon's (Covington, Ky.) timetable calls for full production—some 6 million lbs./year—by the first part of next year.

Add, too, output from Chemstrand's now-producing, though uncompleted, 50-million-lbs. plant at Pensacola (Fla.), and it becomes apparent there's an upcoming nylon market scramble in sight.

Actually, though, observers are confident that stepped-up demand next year will whipsaw through any threatened glut.

•

On the other hand, reduced demand for rayon yarn and staple—plus too-keen competition—is behind Du Pont's announced intention to discontinue all rayon operations at its Buffalo, N. Y., plant.

Production of Cordura yarn—started at Buffalo during the war as a temporary operation to meet military demands—will be consolidated with operations at the company's Richmond, Va., installation come early September.

WEEKLY BUSINESS INDICATORS	Latest Week	Preceding Week	Year Ago
CHEMICAL WEEK Output Index (1947=100)	120.7	117.5	125.9
CHEMICAL WEEK Wholesale Price Index (1947=100)	104.1	104.1	104.8
Bituminous Coal Production (daily average, 1,000 tons)	1,068.0	1,455.0	1,329.0
Steel Ingot Production (1,000 tons)	1,573.0 (est.)	1,534.0 (act.)	2,128.0
Stock Price Index of 13 Chemical Companies (Standard & Poor's Corp.)	329.0	328.8	243.1

MONTHLY INDICATORS—Trade (Million Dollars)	MANUFACTURERS' SALES			MANUFACTURERS' INVENTORIES		
	Latest Month	Preceding Month	Year Ago	Latest Month	Preceding Month	Year Ago
All Manufacturing	$24,099	$24,418	$25,816	$44,805	$45,183	$45,673
Chemicals and allied products	1,680	1,720	1,672	3,061	3,061	3,007
Paper and allied products	723	733	724	1,052	1,047	1,060
Petroleum and coal products	2,071	2,162	2,048	2,775	2,738	2,670
Textile products	1,110	1,073	1,283	2,412	2,412	2,631
Leather and products	301	278	256	593	580	578

The domestic competitive situation and pressure from lower priced imported material combined to squeeze the profit out of Du Pont's staple venture. Result: the staple plant will be mothballed on or about the end of April '55.

•

There'll be more maleic anhydride on the market within the next couple of weeks. Output from National Aniline's new plant at Moundsville, W. Va., will eventually hit a more-than-10-million-lbs./year clip.

Though the tightness of maleic doesn't at the moment, rate a "critical" label, demand from resin business has been so lively of late that some observers anticipate a warm welcome for the soon-due new supply.

•

Despite some overly optimistic reports about the briskness of phthalic anhydride movement, fact is there's still plenty around to meet current consumption needs. Indeed, one marketer points to the reversal in the import-export phthalic picture as concrete evidence of the more-than-ample supply condition here.

During the past few weeks imports have slipped, while some U. S. phthalic is being bought in England and on the Continent.

That doesn't mean, of course, there's a glut in sight; sales have held up fairly well and makers anticipate no need for price altering at this time.

•

Polyvinylpyrrolidone (PVP) is currently some 75¢/lb. cheaper; that's for General Aniline & Film's nonpharmaceutical grade (in 1,000-lb. lots). The material, used in cosmetics and in industrial applications (textile, lithography, ag chemicals, etc.), is now priced at $2/lb.

GAF's pharmaceutical PCP is down $2/lb. to $4. Expanding markets (the preparation of blood volume expander solutions, procaine-penicillin suspensions, and other drug uses) is behind the new cuts.

Further substantial PVP reductions are in the cards when GAF's new Calvert City, Ky., high-pressure acetylene derivatives plant begins pouring out the material sometime near the end of next year.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending July 19, 1954.

UP

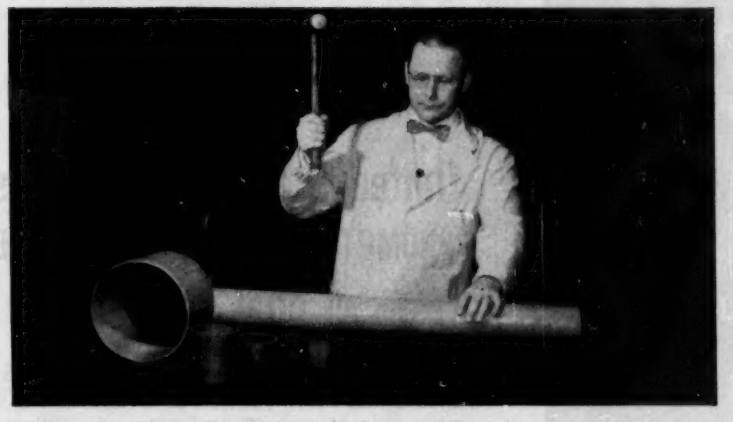
	Change	New Price		Change	New Price
Casein, imp., acid-precip., grd., duty paid	$ .01	$ .25	Tallow, Bleachable, fancy, tks, dlvd.	$ .00125	$ .06125
Eugenol, USP, bots.	.15	2.70	Special, tks, dlvd.	.00125	.0575

All prices per pound unless quantity is stated.

PROGRESS THRU RESEARCH . . . at GENERAL MILLS

Non-Volatile Resin Makes Strong Glass Fiber Laminate

☆☆ Fatty Acids Improve Alkyd Color ☆☆ Fatty Nitrogens for Textiles



A smashing blow with a heavy sledge hammer fails to damage impact-resistant, glass reinforced laminates made with a new blend of Polyamide and epoxy resins.

Producers of glass laminates appreciate the new Polyamide-epoxy resin blends because they show physical properties superior to other thermo-setting materials.

These new resin blends have a natural affinity for glass, in either sheet or fiber form. This affinity helps wet the glass quickly and thoroughly, leading to fewer voids and a better bond of resin to glass. Their water resistance, too, is important to makers of glass reinforced plastic pipe or surface coatings for laboratory furniture and equipment.

Polyamide-epoxy resin blends are resistant to alkali and to a wide range of corrosive chemicals and solvents.

Laboratory test results have shown greatly superior impact strength, especially for the Polyamide Resin 115-epoxy resin blends. Polyamide Resins are non-volatile and have no unpleasant odor. Also, over a year of experimental work has been carried on with no toxic effects to personnel. Tests show that Polyamide Resin is practically unextractable by water or lard oil.

The low shrinkage of Polyamide-epoxy resin blends permits close conformation to the mold, with less tendency to crack during the curing cycle. Low exotherm and low shrinkage are properties which promise a bright future for Polyamide-epoxy blends in the potting and casting and in the tool and die fields . . . especially automotive and aircraft.

For added information, mail the coupon below.

☆☆☆☆☆

Did You Ever Notice that the subdued-light side of a white-painted object is often yellower than the exposed side? The action of linolenic acids in the alkyds causes this yellowing.

Such discoloring does not happen with alkyds made from General Mills Aliphats (fatty acids) 16-A and 16-BW. Each is a fractionally distilled and refined combination of oleic and linoleic acids, with no linolenic acids present. This feature, and the high unsaturated acid content, makes these fatty acids excellent raw materials for producing glycerol-phthalate resins for superior non-yellowing enamels and varnishes with water-white properties.

Because of their excellent color stability and rapid baking qualities, Aliphats 16-A and 16-BW are also suitable for alkyd resins used as plasticizers in air-drying lacquers and enamels, and in baked finishes in conjunction with urea or melamine resins.

Typical composition of Aliphat 16-A is 55 per cent linoleic acid (91 percent oleic and linoleic) and of Aliphat 16-BW, 56 per cent linoleic acid (88 per cent oleic and linoleic).

If you would like more information on General Mills fatty acids, please mail the coupon below.

☆☆☆☆☆

Fatty Nitrogen Compounds became an even larger part of the General Mills chemical picture recently with the commercial introduction of two new fatty nitrogens—General Mills Alitrile 7 D and Alamide H 26.

Alitrile 7 D (distilled stearo-nitrile) and Alamide H 26 (hydrogenated tallow amide) are chemical intermediates in making textile finishes which impart durable water-repellency to articles such as hats, raincoats and play clothes. They also afford certain antistatic, wrinkle resistant properties; help improve the "hand" of the cloth.

Durable water repellents derived from Alamide H 26 work exceptionally well on cottons and rayons. The excellent color and color stability of Alamide H 26 carry over into the textile finish.

For more information about General Mills fatty nitrogen compounds, just mail the coupon below.

PROGRESS THRU RESEARCH

General Mills ☆☆☆☆☆ **CHEMICAL DIVISION**
KANKAKEE, ILLINOIS

Please send me additional technical information for the products checked below.

- ☐ Polyamide Resin 115 (for use with epoxy resins)
- ☐ Aliphat 16-A
- ☐ Aliphat 16-BW
- ☐ Alitrile 7 D
- ☐ Alamide H 26

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TOLUOL
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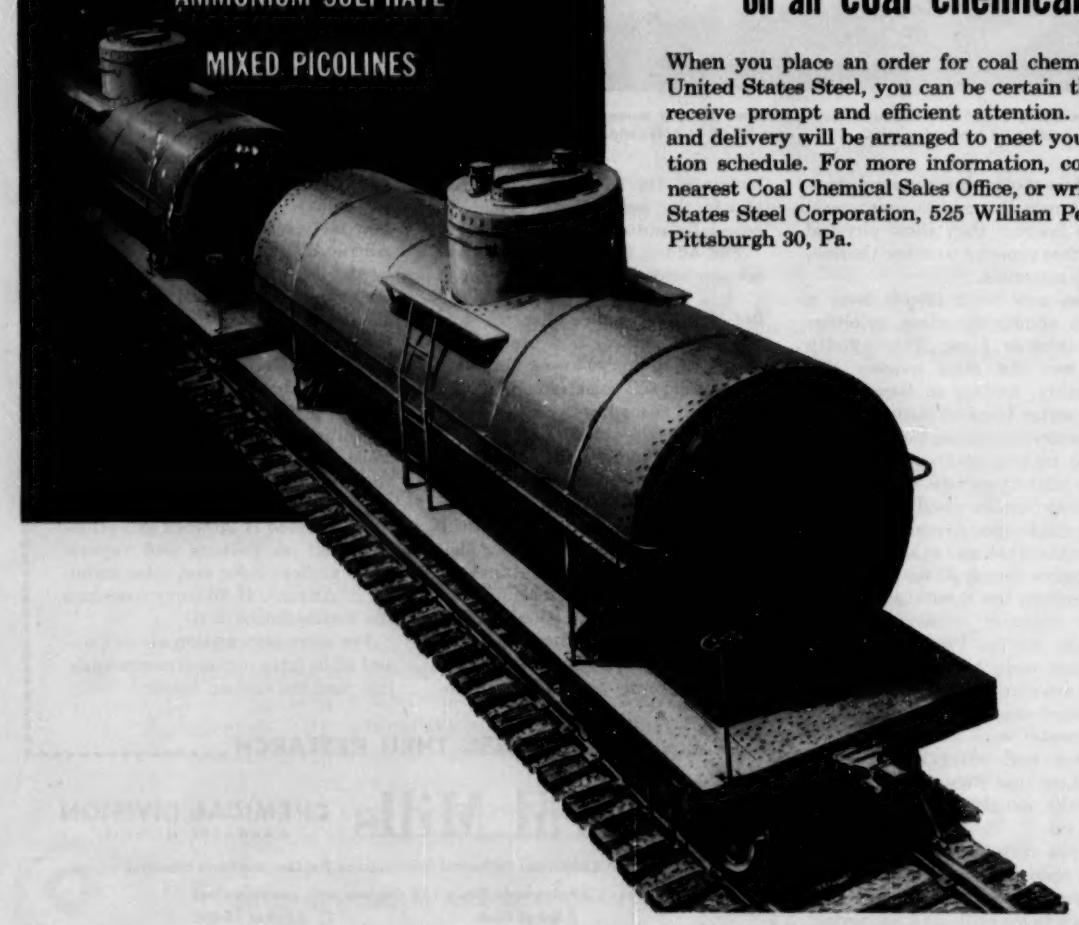
NAPHTHALENE
PYRIDINE
ALPHA PICOLINE
AMMONIUM SULPHATE
MIXED PICOLINES



United States Steel offers PROMPT and EFFICIENT SERVICE on all coal chemicals

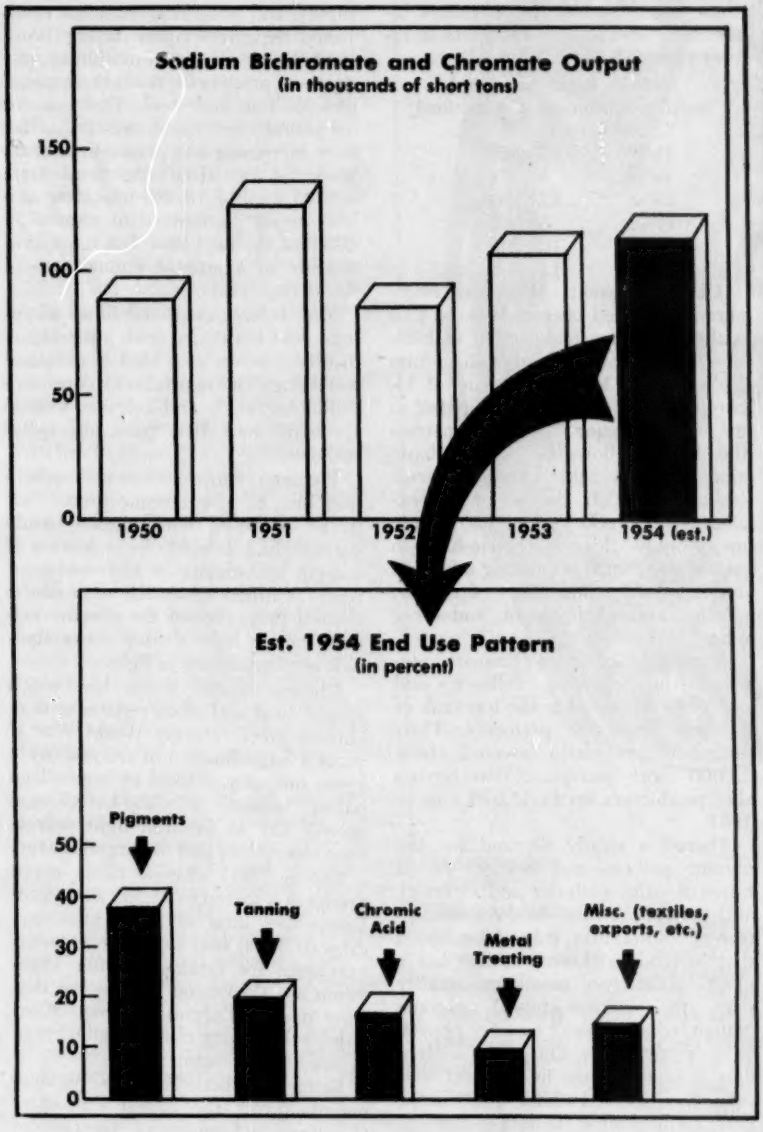
When you place an order for coal chemicals with United States Steel, you can be certain that it will receive prompt and efficient attention. Shipment and delivery will be arranged to meet your production schedule. For more information, contact our nearest Coal Chemical Sales Office, or write United States Steel Corporation, 525 William Penn Place, Pittsburgh 30, Pa.

USS Coal Chemicals

USS

4-471

UNITED STATES STEEL



Chromates for Integration

How promising are chrome-chemical markets? Two major companies—Allied Chemical & Dye Corp. and Pittsburgh Plate Glass Co.—think they are good enough to integrate with their own lines.

Allied will soon tuck Mutual Chemical Co. of America under its wing, will probably supply it with soda ash from its Solvay Div. and sulfuric acid from its General Div., will market its bichromate and coproduct sodium sulfate.*

And Pittsburgh Plate Glass has just revealed plans to acquire Natural Products Refining Co. (*CW, Newsletter, July 17*), will probably supply it with soda ash from its Columbia-Southern Div., though it may not use Natural Product's salt cake in its glass making. Pittsburgh may market most, use some of the chrome chemicals.

These mergers will leave two major independent chrome chemical producers: Diamond Alkali (Cleveland) and Imperial Paper and Color Corp. (Glens Falls, N.Y.) These two companies, together with Mutual and Natural Products, have turned out

* The U.S. chrome industry produced 117,199 tons coproduct sodium sulfate (chrome cake) in 1951; 80,685 tons in 1952, and an estimated 103,000 tons last year.

MAIL COUPON BELOW

The BETTER the ODOR the BIGGER the SALES!

MASKING MALODORANTS

Malodorants—usually mercaptan or cyclic sulfide—are added in small percentages to odorless natural gas and to liquid petroleum gas to provide a means of quick detection when escaping gas or leakages occur. In the handling of these substances there are bound to be accidental spillages. To determine the most effective means of neutralizing the overpowering odors arising therefrom, a recent exhaustive survey, independently conducted, found our NEUTROLEUM* to be the most acceptable all-purpose masking agent tested. Highly concentrated and inexpensive, this powerful specialty provides remarkable odor coverage at negligible cost.... For the answer to your odor problem, use coupon below.

*Reg. U.S. Pat. Off.

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☐ SPRAYS ☐ TEXTILE CHEMICALS
☐ OTHERS: _____

(Note: Please send accompanying letter giving details of your particular problem.)

COMPANY: _____
ADDRESS: _____
CITY: _____ STATE: _____
ATTENTION: _____
TITLE: _____

FRITZSCHE Brothers, Inc.
Established 1871
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For larger-than-laboratory amounts of a Rare organic

● **Better ask Eastman to make it for you!**

Skilled professional personnel, with their wide experience in producing over 3500 Eastman Organic Chemicals, will be glad to help you. And our great variety of equipment for all types of organic reactions is at your service for bulk production.

For information or a quotation, write to *Distillation Products Industries*, Eastman Organic Chemicals Department, Rochester 3, N. Y.

DPi

DISTILLATION PRODUCTS INDUSTRIES
is a division of
EASTMAN KODAK COMPANY

these annual quantities of sodium bichromate and sodium chromate in recent years:

Sodium Bichromate and Sodium Chromate Production†
(short tons)

1949	75,652
1950	89,829
1951	127,634
1952	88,905
1953	108,245
1954	114,000 (est.)

Chrome Parent: Whatever major chromium-based chemicals these four major producers make, they will derive virtually all of them from sodium bichromate. The largest share of bichromate—about 38%—is estimated to go into the major chrome pigments—the chrome yellows and oranges, basic zinc chromate, the chrome greens. Industrial outlets for pigments (excluding the blacks and whites) divide up roughly this way: one-half in paints, one-fourth in printing inks, and one-fourth in a miscellany of rubber, plastics, textiles, linoleum, and other uses.

Popularity of lead chromate pigments—the chrome yellows and oranges—puts them in the top rank of synthetic inorganic pigments. Their output has regularly hovered about 25,000 short tons/year. War buying shot production up to 31,046 tons in 1951.

There's a steady demand for the chrome yellows and oranges in all types of paint (interior and exterior) and in printing inks. In the manufacture of colored inks, it has been found that molybdate chrome orange has a more satisfactory working quality than the coarser-grained chrome orange, which doesn't transfer as well on printing rollers. Output of molybdate chrome orange in the past four years has hovered about 4,000 tons/year, about double the rate in the late '40s.

Medium chrome yellow (normal lead chromate) is the biggest seller of the chrome yellow group. Pigment makers produce the light, somewhat greenish yellows (known as "excelsiors") by coprecipitating monoclinic lead chromate and lead sulfate. They obtain the greenish "primrose" and "lemon" yellows simply by varying conditions to give the rhombic instead of the monoclinic form. Addition of basic lead chromate to the coprecipitated lead chromate and sulfate yields the chrome oranges.

Primer Pigment: Still another yellow, zinc yellow (potassium zinc chromate), and basic zinc chromate established their reputation during World War II as corrosion-inhibiting pigments in primers for nonferrous metals and for iron and steel. Their success on aircraft and naval vessels has led to an increasing acceptance in industry since the war. Here's the trend: from a 1945 total of 12,326 tons, zinc yellow output plummeted to a mere 2,296 tons the next year, but has grown steadily to a current annual rate of 6,500 tons/year

Zinc yellow, dispersed in an alkyd-type vehicle thinned with a petroleum distillate, serves as a kind of chemical watchdog: it neutralizes corrosion-producing acids and releases soluble chromate ions that passivate metal surfaces.

Pigmenters mix chrome yellow with iron blue to give chrome green (not to be confused with chrome oxide green, which is made by reduction of sodium bichromate at high temperatures). Chrome green has most of the desired properties of the chrome yellows, but in light shades shares their lack of permanency in light.

Chrome oxide green has much greater heat and alkali resistance than chrome green. During World War II years a large fraction of chrome oxide green output was used in camouflage paints because it (unlike chrome green) has an infrared light reflectance resembling that of natural foliage.

During 1951 chrome oxide green production soared to 11,599 short tons. Last year's total of 9,586 tons may drop to 5,600 tons this year. Reason: purchases for making metallic chromium are slackening. It's known that Electro Metallurgical (Union Carbide) is bypassing chrome oxide green in making the metal.

Better Leather: Next to pigment manufacturers, the largest consumers of sodium bichromate are the chrome tanners of leather. They buy about 20% of the annual output of sodium bichromate, either as the bichromate itself or as ready-to-use trade mixtures that contain roughly 25% as chromic oxide. Tanning is actually effected in a solution of basic chromic sulfate, made by the reduction of sodium bichromate.

Shoe upper leather production and tanning, and consequent use of bichromate, have been fairly constant over the past few years. About 90% of all shoe upper leather is chrome-tanned (*CW, Aug. 22, '53, p. 65*). Chrome-tanned, too, are hides and skins for gloves, garments, and the retan of sole leather. Tanning baths are soon depleted of chrome content, for about 60% of the chromium in the

† The Bureau of the Census combines reported production figures of sodium bichromate and sodium chromate. It's estimated that the bichromate accounts for 95-97% of the total.

tan liquor becomes fixed in the hides.

Chromic acid (chromium trioxide) vies closely with leather tanning for second place as an outlet for sodium bichromate. It has dipped regularly into sodium bichromate supplies for anywhere from 17-21% of the latter's annual output—for about 26,000 tons in 1951, probably 19,000 tons in '54.

From the war-induced output of 17,585 short tons in 1951, production of chromic acid slid to 9,831 tons in 1952, but bounded back to 15,382 tons last year, may reach 13,000 tons this year.

Over three-fourths of chromic acid output goes into metal treatment. That amount, of course, augments the 10% of sodium bichromate estimated to be used for metal treatment also (*see chart, p. 69*).

Chromic acid is the chromium source in baths for decorative chrome plating of automobile fixtures, electrical appliances, and the like. Hard, industrial chrome plate (0.0005-0.01 in. thick) is becoming increasingly popular on industrial moving parts—drills, reamers, drawing dies, printing plates, diesel engine piston rings and liners, etc. Anodizing of most aluminum alloy aircraft parts consumes a sizable amount of chromic acid—particularly in wartime.

Both chromic acid and sodium bichromate serve to acid-pickle metal surfaces—to clean them of oxide films and scale formed by hot working operations. Similar solutions are prepared for bright dipping, which makes certain metal surfaces brighter and smoother and improves their corrosion resistance by leaving a passivated surface.

Color Climb: Corrosion inhibition in one of the fastest growing outlets for sodium bichromate-derived chemicals. And a leading chrome pigment executive points to an ever-increasing use of color in consumer articles as a dominant and durable prop under sodium bichromate manufacture.

Coal Chemical Glance

During the past few weeks marketing men with a flair for statistics have been scanning a raft of government figures on production and sales of synthetic organic chemicals. Although the data is labeled preliminary and somewhat incomplete, the U.S. Tariff Commission's Chemical Division compilers include a sufficiently large percentage of this country's output and sales to give a fairly accurate—and official—picture of synthetic organic chemicals activity.

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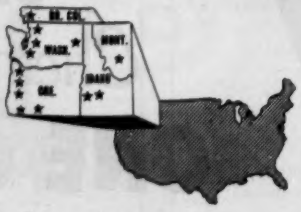

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MARKETS . . . . .

of 14 such reports is on by-product coal chemicals.

The highballing clip in the coke-oven industry last year jacked up production of all tars (coal, water-gas, oil-gas) some 16.6% over 1952. The score: 1953, 924 million gal.; the previous year, 793 million.

Production of industrial- and specification-grade benzenes last year (including petrobenzene) amounted to 273 million gal. compared with 252 million in 1952. Sales of benzene in 1953 were up about $13 million's worth over the post-Korea slump in '52—233 million gal. (valued at $96 million) vs 217 million gal. (worth $83 million).

Toluene, too, as was expected by most crystal-balling marketers, showed a hefty gain. In 1953 production (including toluene from petroleum for avgas use) hit 156 million gal., slightly more than 50 million higher than during the previous year. Sales of toluene totaled 130 million gal., with a dollar value of 39 million, or nearly 58% better than '52's $25 million.

And last year xylenes filled out the mantle of a big-time chemical (*CW, Oct. 19, '53, p. 73*). Output nudged 113.5 million gal., some 58.2% over the near-72 million gal. produced in 1952. Sales amounted to almost 66 million gal. ($17 million) compared with 58 million gal. and $14 million during the prior 12-month period.

Petroleum operators' xylene output accounted for bulk of the total—some 102.9 million gal. Coke ovens produced about 9.9 million, while tar distillers turned out approximately 660,000 gal. During '52 the sources breakdown, respectively, was 61.6 million gal., 8.1 million gal., and 2.1 million gal.

On the other hand, naphthalene production suffered a 47-million-lb. dive last year from '52's 322.5 million to approximately 276 million. Pounds sold, and value, racked up this way: '53, 200 million ($11.1 million); '52, 209.7 million lbs. ($14 million).

Down, too, were sales of creosote oil—125 million vs 140 million gal.—although production continued to inch ahead. Output in 1953 was slightly more than 145 million gal., an increase of 4.7% over the 139 million reported for 1952.

The Tariff Commission's preliminary annual report is issued in separate sections covering the gamut of synthetic organic chemicals. A final report giving complete statistics is due later this year.

Individual copies of the various '53 sections may be obtained by writing to the U.S. Tariff Commission, Washington 25, D.C.

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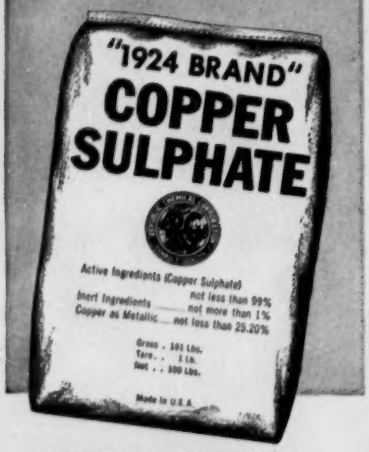
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SLOAN-KETTERING'S STOCK: Industry's chemicals further his cause.

New Hope in Chemicals

Last week, the world of science rubbed its startled eyes and took a second look at news from New York's Sloan-Kettering Institute that a 100% cure in rat-cancer tests had been effected with the experimental drug, triethylene melamine. Only one form of cancer was found to be completely vulnerable to the compound and this was true only for rats. But the discovery touched off renewed optimism that chemicals will someday provide the key to the cancer problem.

The new find is credited to the institute's division of experimental chemotherapy, headed up by C. Chester Stock. His crew of researchers* also reported the recent cure of 98% of one type of mouse leukemia, with a combination of O-diazoacetyl-L-serine (*CW, March 27, p. 62*) and 6-mercaptopurine. Other promising drugs they're looking at include aminopterin, triethylene phosphoramide, and triethylene thiophosphoramide.

Taken in context with comparable studies at a score of places, it adds up to a strongly increasing emphasis on chemicals—and, although it may not be generally appreciated, an expanding role in cancer research for the chemical industry.

A look at some cancer research budgets documents this trend toward the chemotherapeutic approach. Out of $15,096,000 earmarked by the National Cancer Institute (Bethesda, Md.) for grants, $2,300,000 is being spent on research in chemotherapy; of $6,641,000 needed by the institute for its own operations, at least $500,000 is going for chemical studies.

At Sloan-Kettering, over half of the $2,900,000 annual budget is being spent on clinical (human) and experimental (animal) research in cancer chemotherapy. And the American Cancer Society reports that mounting interest in this form of research is evident at other cancer research centers. Among the leaders in this respect (aside from S-K) are Georgetown University medical school (Washington, D.C.), Southern Research Institute (Birmingham), Children's Hospital (Boston), and the medical schools at the University of California (Berkeley) and the University of Southern California (Los Angeles).

Working hand in hand with the scientists who screen potential anticancer agents is a list of companies that reads like a cross-section of the chemical industry. Prominent among these are American Cyanamid's Lederle Laboratories and the Burroughs-Wellcome laboratories, which supply hopeful chemicals, also do some evaluation.

* Including Donald Clarke (solid tumor screening), John Biesele (cell growth), H. Christine Reilly (antibiotics), Kanematsu Sugiura (tumor spectrum), Frederick Philips (pharmacology), David Karnofsky (embryology), and Joseph Burchenal (leukemia).

WHERE WE STAND TODAY

These chemicals currently stock the anticancer arsenal, provide the most promising starting points for further research.

1. Hormones—ACTH, cortisone, estrogens, and androgens.
2. Folic acid antagonists—aminopterin.
3. Nitrogen mustards and related compounds—triethylene melamine, triethylene phosphoramide, 1,4-dimethanesulfonoxybutane.
4. Antimetabolites—6-mercaptopurine.
5. Amino acid derivatives—azaserine.
6. And urethane—the only known active member of its class.

As might be expected, most pharmaceutical firms contribute compounds to the various screening centers. Merck, Parke Davis, Upjohn, Pfizer, and Mallinckrodt are among the leaders in this effort. In addition, Schwarz Laboratories (Mount Vernon, N.Y.), Pabst Brewing Co. (Milwaukee), among others, make a flock of biochemicals (purines, pyrimidines, etc.), most of which have been tried for anticancer action.

But a lot of other chemical makers, not ordinarily associated with pharmaceuticals, have submitted substances for screening. Among these are Standard Oil's Esso Laboratories, Du Pont, Union Carbide, Rohm & Haas, Dow, Virginia-Carolina, and many others.

Truth of the matter is that any source, company or individual, of chemicals can have them appraised and (if deemed worthwhile) tested free of charge at Sloan-Kettering. The sender retains patent rights. Only requirement is that he identify the compound to be tested.

At Sloan-Kettering over 12,500 chemical compounds and 13,462 natural products (e.g., bacteria, moulds, plant extracts) have been screened. Even inorganics such as sodium, nickel, and cobalt chlorides have been tried—with little success. But the institute's scientists do not rule out further work with inorganics, intend to try any conceivable compound in their search for a therapeutic weapon.

While the cancer-cure seekers are not taking anything for granted, they are concentrating on certain well-defined areas (*see box*). David Greenburg, professor of physiological chemistry at the University of California and director of the cancer drug-screening work there, holds out most hope for two classes of chemicals: nitrogen mustards and purine analogues (e.g., 6-mercaptopurine). Greenburg's estimate is grounded in his experience with about 400 compounds he has checked for anticancer activity in the past five years, including some from Monsanto, Goodrich Rubber's chemical division, and Shell Development.

One of the most promising new agents is the British-developed Myleran—1,4-dimethanesulfonoxybutane.

The antibiotic actinomycin and triethylene phosphoramide continue to be of interest to John Field, mentor of the cancer chemotherapy screening laboratory at the University of Southern California's school of medicine. He's looked at approximately 1,200 chemicals, received at the rate of about 100 samples a month.

"If we had to synthesize these chemicals ourselves, we would never have more than a handful—it's too expensive," he explains. Besides domestic firms like Mallinckrodt, Abbott, Hoffmann-La Roche, Smith Kline & French, and Erwin Neisler, foreign sources—e.g., Les Laboratoires Roussell (France) and Astra and Karolinska Institute (Sweden)—have supplied some of the grist for USC's screening mill.

From this, it's evident that the chemical supply lines of the cancer fighters are far-flung. As it is, they are up against one of the most baffling biochemical puzzles ever tackled. Without the widespread cooperation of the entire chemical world, their goal would be well-nigh insurmountable.

Screening of prospective cancer

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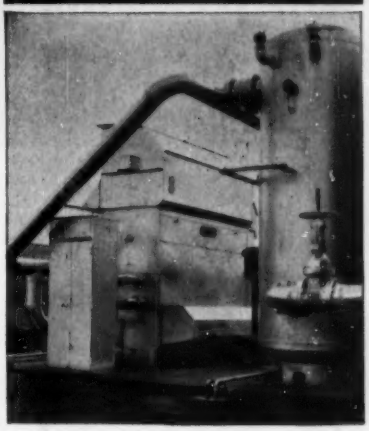

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drugs with mice (*see above*) is a relatively straightforward process at Sloan-Kettering, involves three basic steps: (1) implanting a small tumor, which is allowed to grow for 24 hours; (2) injecting the chemical twice daily for seven days: (3) checking the tumor growth (if any) on the eighth day. Other research groups rely on essentially the same procedure, though they may vary the details in their respective techniques.

The bulk of preliminary screening is done on mice implanted with sarcoma 180, a strain of cancer chosen because it grows rapidly, is of average sensitivity, routinely transplanted with nearly 100% success, and does not require an inbred strain of mice.

Compounds that are found to inhibit tumor growth, either markedly or moderately, are tested further on a variety (spectrum) of tumors. Chemical candidates that survive this fine screening may be evaluated further on human patients. The goal, of course,

Sifting Chemicals with a Bio-Screen

FINDING an active cancer-inhibiting compound is a problem akin to discovering pebbles in the sand. The principle is the same; but it takes a different kind of screen to do the sifting.

At New York's Sloan-Kettering Institute, focal point of cancer chemotherapy research, the screen is a white rat implanted with a tumor of the hardy sarcoma 180 strain. In recent years, more than 12,000 chemicals have filtered through scores of generations of this biological screen. A precious few (including the highly promising triethylene melamine) were retained, their anticancer activity graphically delineated by the procedure shown, in part, in these pictures.

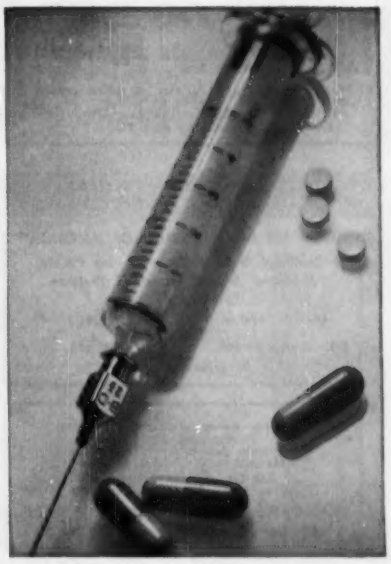
Actual evaluation of a compound begins (*upper left*) when it is injected —twice daily for a week—into test rats with cancers of determined size. On the eighth day the tumor is again measured (*above*), carefully inspected for growth, recession or changes of character.

If a chemical is found that causes a regression of the tumor, it is tested against a wide variety of tumors in other laboratories of the institute, such as the one shown at the left. Both animals in this picture were implanted with the same malignancy. In sharp contrast with its companion, one at the right, which received triethylene melamine, shows no sign of disease.

A compound that shows little activity against one type of tumor may be many times as potent in combating others. Hence it must be tried against as many as is possible.

is a compound that can kill off cancer cells without harming normal cells. So far, nothing completely fulfills this simple requirement. But the fact that certain compounds give temporary help does a lot to foster the belief that some day fully effective agents for all types of cancer will be found.

Keystone of modern efforts to achieve a cancer cure is the classical principle of "the heterogeneity of nucleic acid anabolism." It means, simply, that each cell (including a cancerous one) has special food requirements. Selective starvation of the abnormal cells is the aim of chemotherapy. Progress in this direction, once thought impossible, has been greatly enhanced by the initiative of the chemical industry in supplying thousands of unusual compounds used in cancer research. Now that the latest findings clearly vindicate the proponents of intensive chemotherapy research, industry's help will be needed more than ever.



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RESEARCH . . . . .

Liberated Know-How

A clutch of chemical inventions are described in a new group of government-owned patents released to the public. Worth a close look by industry are those dealing with enzymes, organic acids, vinyl polymers, deodorization and protective coatings.

Fermentation in the presence of low molecular-weight alcohols and esters is the key to preparation of the acids (citric, itaconic and ethylene oxide dicarboxylic) noted in patent 2,674,-561. The fruit of research by Dept. of Agriculture, the method is based on the yield-boosting prowess of its organic additives.

Plasticized polyvinyl chloride is the subject of 2,676,941, also assigned to USDA. The plasticizers in question are unique diester reaction products of alkyl chlorocarbonates and glycol dilactates, also serve to modify ethyl cellulose and cellulose acetate.

Also dealing with polymers is patent 2,676,942 covering a corrosion-resistant coating for metals. A mixture of vinyl methacrylate resins in low-boiling solvents, a plasticizer and corrosion inhibitor, the formulation was developed by Navy researchers, is administered by the Navy Dept.'s patent counsel.

Rounding out the group are 2,674,-518 (preparation of uranium tetrafluoride; 2,674,554 (soldering flux); 2,674,609 (deodorization process); 2,676,905 (starch-saccharifying enzymes); 2,676,906 (lipase preparations); and 2,676,972 (hydrogenation derivatives of difurfurylacetone). Most will be licensed on a nonexclusive, royalty-free basis.

•

Lasting Safety: Working without a lost-time injury for nearly seven years, Dow Chemical Co.'s central laboratory (Freeport, Tex.) employees recently received their tenth straight safety certificate. The awards marked completion of 1 million man-hours of work without a single loss of time due to injury. The laboratory's safety program is based on individual participation by every person concerned. Each member of the department is also a member of a safety group, takes his turn as chairman for biweekly meetings. Department supervisors sit in on these meetings, report on safety activities of other groups. Departmentwide safety sessions are also held, serve to disseminate information on latest accident-prevention techniques.

•

New Division: An adhesives division has recently been set up by the Carboline Co. (St. Louis). The new division, according to the company, will

be concerned with special-application adhesives. Carboline has experience with such adhesive problems as cold-bonding sponge rubber to steel, and the bonding of synthetic rubber to steel.

•

No Secret: In a sharp shift of policy, the Atomic Energy Commission is now encouraging unclassified research on the metallurgy of uranium and its alloys. Typical unclassified studies that can be undertaken include mechanisms of corrosion, electronics structures, etc. But there are still some hitches to unbridled private research. Any subject considered for research must have prior approval by AEC's Office of Classification. Project leaders must have security clearance to insure proper disposition of any classified information that might be uncovered. And technical reports must be reviewed by AEC before publication. As funds become available, AEC will provide financial support to worthy research projects, also supply small amounts of natural uranium free of charge in return for information developed. Interested researchers may contact AEC's division of research, Washington 25, D.C.

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High-Purity: Offered for the first time in high-purity reagent grade is Fisher Scientific Co.'s (Pittsburgh) isopropyl ether. Claims for the product are a water content of less than 0.05% and alcohol under 0.1%. Packaged in volume units, price range is from $2.35/pint to $14/gal.

•

X-ray Eye: Newly disclosed by General Electric Co. is its X-ray microscope claimed to have wide potential use in industry. Magnifying up to 1,500 diameters in three dimensions, the new instrument is said to identify mixtures of plastics by relative X-ray absorption, speed research in adhesives, paints, etc.

•

Economy Size: Two new low-budget atomic research reactors comprise Babcock & Wilcox Co.'s bid for a piece of the unfolding private atomic energy business. Modified versions of the declassified "water boiler" and "swimming pool" types, the new models are priced in the $100,000-150,000 range. Exact cost hinges on specifications and installation problems. Potential applications for the two, the company states, are in neutron experiments, radiation chemistry, biological research, radioisotope production, materials development and engineering education.

•

Plans: Strong evidence of Du Pont

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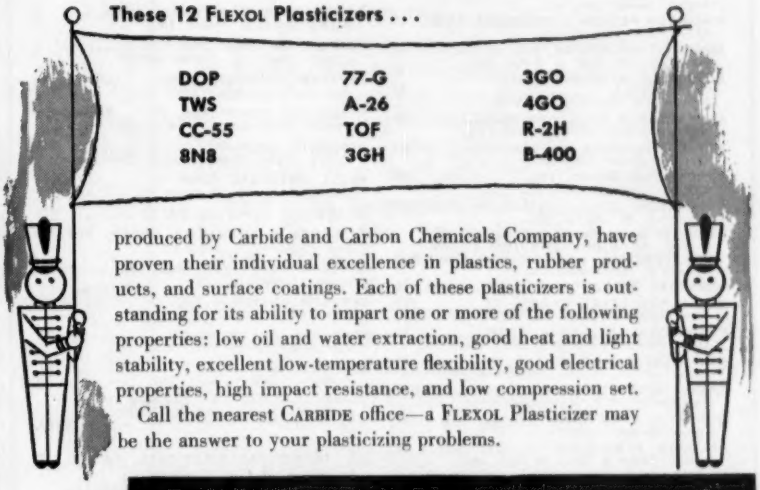

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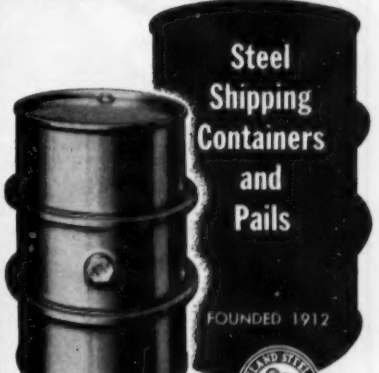

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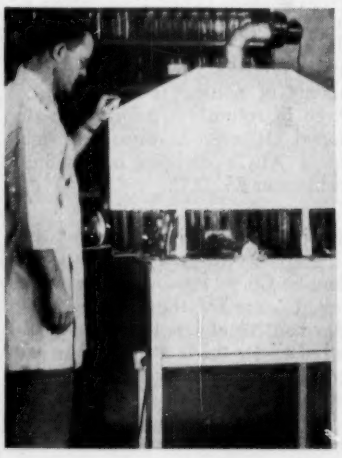
RESEARCH . . . . . •

Co. of Canada's intention to push a vigorous program of research is last week's revelation of the firm's plans for a new research center at Kingston, Ont. Already blueprinted is the center's first structure, a $1.5-million research laboratory. When completed, the building will have a floor area of 30,000 sq. ft., will accommodate about 80. It should be finished by fall of next year. In its entirety, the planned research center will comprise five laboratory buildings on a 25-acre site adjacent to the company's Carruthers Point (about four miles from downtown Kingston) nylon spinning plant.

• Further along is a new research laboratory at Hercules Powder Co.'s Brunswick, Ga., plant. To cost about $100,000, the laboratory will shelter studies tied closely to the plant's naval stores operations.



Weather Wheel

YOU DON'T HAVE TO go outdoors to be exposed to the elements, as this picture proves.

Taken in one of U.S. Steel's Pittsburgh research laboratories, picture shows a practical, low-cost approach to simulated weathering tests. Heart of the method is the bicycle-wheel apparatus shown above. Clipped to the wheel's rim are wood blocks that have been treated with different preservatives. As the wheel rotates the blocks are, in turn, drenched (in the tub), dried, heated (with infrared lamps) and doused again. This cycle continues for 28 days after which the "weathered" blocks are inoculated with fungus to gauge the effectiveness of the preservative remaining in the wood.

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For specific details, address Sales Manager, Chemical Division, Reichhold Chemicals, Inc., 630 Fifth Avenue, New York 20, N. Y.

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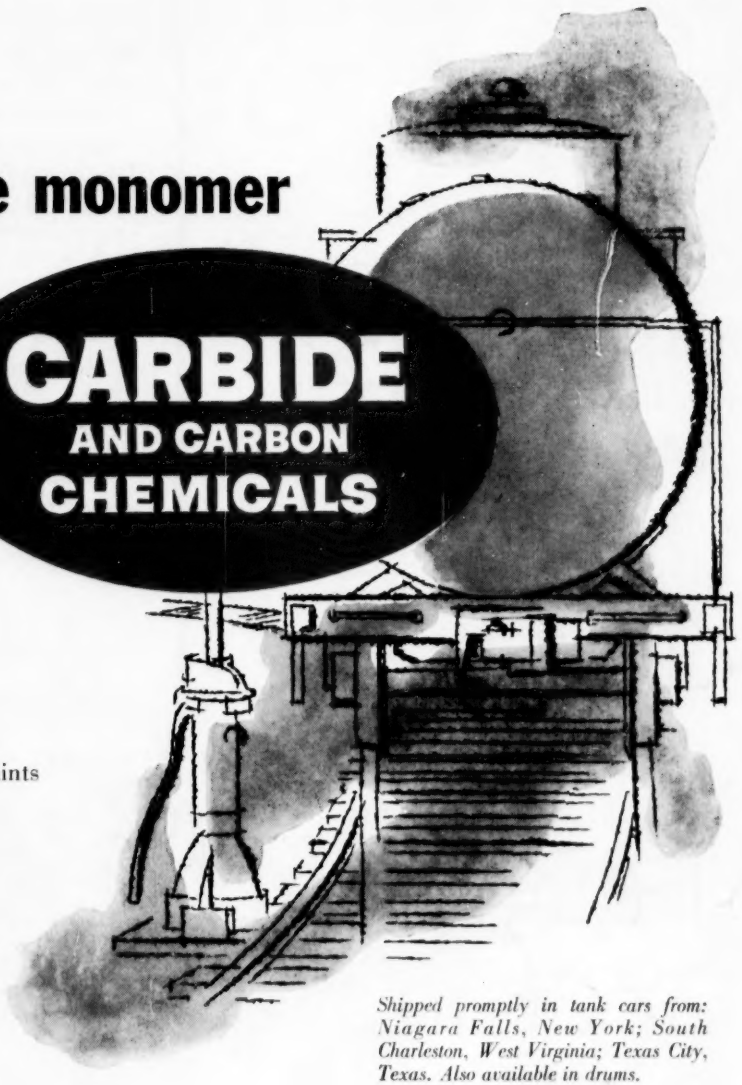

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The properties of vinyl acetate can be substantially modified through copolymerization. Benefits that can be realized from the use of co-monomers include internal plasticization, improved water-resistance, and greater adhesion. Many ethylenic monomers that copolymerize with vinyl acetate are produced by CARBIDE. Examples are maleic anhydride, maleic esters, acrylonitrile, higher vinyl esters, vinyl chloride, and acrylic esters.

NIACET brand vinyl acetate is available in two grades. The *DPA grade* is inhibited with diphenyl amine and can be stored safely for two years—the inhibitor must be removed before polymerization. The *HQ grade* is inhibited with hydroquinone and should be polymerized within 60 days without removing the inhibitor.

Additional Information Available

For samples, specifications, prices, or further information on vinyl acetate or other monomers mentioned—call or write Carbide and Carbon Chemicals Company, a Division of Union Carbide and Carbon Corporation, 30 East 42nd Street, New York 17, New York. Offices in principal cities—in Canada: Carbide Chemicals Sales Company, Division of Union Carbide Canada Limited, Toronto.

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